

FLIGHT

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AIRCRAFT ENGINEER
AND AIRSHIPS

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Founder and Editor: STANLEY SPOONER

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EDITORIAL COMMENT



THE record for the time which a light aeroplane takes to fly between England and India is being lowered so frequently and so substantially that it is difficult to keep track of the changes. Mr. Mollison and his Gipsy "Moth" have accomplished the trip in less than ten days, and already we hear of plans by himself and by Air Commodore Kingsford-Smith to reduce the time still further. We hardly know whether to wonder at each feat or to take it as a matter of course. One can become sated with wonders of achievement as well as with grandeur. "Visions of glory! Spare my aching eyes," sang a Welsh bard in a poem which many of us had to learn in our childhood. We also remember a kind of Utopia described by the Grand Inquisitor in "The Gondoliers" where "Dukes were three a penny" (or thereabouts). So now hollow-eyed pilots who have sacrificed their sleep to speed across the world faster than anyone has done before are so numerous that none of them can command the admiration which is really his due, and which each would have received had his flight been made a few years earlier.

Another Record Broken

Quite naturally and rightly it is always the pioneer whose name lives in our memory. Though the Channel is now flown many times a day throughout the year, it is Blériot whom we shall always remember as the Channel flyer *par excellence*. More pilots than we can readily remember have now flown between England and Australia, but Ross Smith was the first pilot who made the flight, and Hinkler was the first to do it in a light aeroplane. Hinkler's record stood for over two years, and it was a record in so many ways that it will probably always be considered the most remarkable and meritorious of all the flights between the two countries. Kingsford-Smith beat Hinkler's time last year. This year Scott beat that of Kingsford-Smith; and now Mollison has substantially lowered Scott's record.

In all this succession of great flights, one factor alone seems constant and calculable. That is the

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

1931

- Aug. 15. Scarborough Ae.C. Air Pageant.
- Aug. 15. Manchester-Liverpool Inter-City Race.
- Aug. 15. Irish Ae.C. Meeting, Baldonnel Aerodrome.
- Aug. 18-19. Visit of Graf Zeppelin Airship to Hanworth.
- Aug. 22. Northants. Flying Party at Horsey Toll.
- Aug. 22. Newcastle-on-Tyne Air Pageant, Cramlington.
- Aug. 29. Flying Meeting at Yarmouth.
- Aug. 29-Sept. 5. Boulogne Air Week.
- Aug. 29-Sept. 7. U.S. National Air Races, Cleveland, Ohio.
- Sept. 2. Exhibition of Aerodrome Lighting at Croydon Aerodrome.
- Sept. 5. Norfolk and Norwich Ae.C. Display at Yarmouth.
- Sept. 5. Haldon Flying Meeting.
- Sept. 12. Schneider Trophy Contest.
- Sept. 16. "Development of Aircraft Manufacturing," Wilbur Wright Memorial Lecture, by Glenn L. Martin, before R.Ae.S.
- Sept. 19. All-Women's Aviation Meeting at Northamptonshire Ae.C., Sywell.
- Sept. 23-Oct. 11. French Two-Seater Light 'Plane Competition.
- Sept. 26. Garden Party, Bristol and Wessex Ae.C.
- Oct. 4. International Gliding Competition, Balsdean, Sussex.
- Oct. 8. Balloon Ascent, Lecture by Prof. Piccard before R.Ae.S.
- Oct. 15. "Protection of Metals in Aircraft Construction," Lecture by H. Sutton before R.Ae.S.
- Oct. 29. "Accidents in Civil Aviation," Lecture by Capt. A. G. Lamplugh before R.Ae.S.
- Nov. 5. "Safety in Spinning," Lecture by H. B. Irving before R.Ae.S.
- Nov. 19. "Aircraft Vibration," Lecture by H. Constant before R.Ae.S.
- Dec. 3. "Wheel Brakes and Undercarriages," Lecture by S. Scott Hall before R.Ae.S.
- Dec. 10. "Air Flow—Demonstrations on the Screen by Means of Smoke," Lecture by W. S. Farren before R.Ae.S.
- Dec. 17. "Control Beyond the Stall," Lecture by Dr. G. V. Lachmann before R.Ae.S.

human factor. It seems that whatever test of endurance is set, a pilot will be found who will rise to the occasion. These remarkable men can do with a minimum of food and almost entirely without sleep for days on end, and yet can work desperately on overhauls when on the ground and can retain all their faculties and skill to meet the difficulties of flying and of landing. There seems no limit to the calls which can be met by a thoroughly fit human frame. We must marvel at each demonstration of this, though even greater feats of endurance were accomplished by men, often ordinary privates of the infantry, in the great war, and in many previous wars.

The real marvel is that the machine can so often equal the endurance of the man. The improvement in the quality of light aero engines has played a great part of the progressive breaking of so many air records. The light aeroplanes themselves have also improved. The experience of the forerunners also helps each new aspirant at making a new fastest time. These flights are an outward and visible sign of the improvements in the machine and the engine, and as such do valuable service to the cause of flying.

As for the actual record, that is a matter of less importance. Records which are merely records and which do not teach any valuable lesson are chiefly of interest to the class of mind which gets wildly excited as to whether Sutcliffe or the Nawab of Pataudi is head of the batting averages for the season. For record purposes we have only been reckoning flights by light aeroplanes, and these, of course, could easily be beaten by aeroplanes of a different class. A record by a fast machine would be more useful than a record by a light aeroplane, because it would bring us nearer to a speeding-up of commerce. More useful than that would be a record in which the machine was flown by relays of pilots, so that it was only the machine and engine which were tested and not the human factor. Most useful of all would be a record on the lines of a relay race, in which as many machines and pilots took part as was thought desirable, the object being to get a piece of cargo, say a letter, from England to Australia in the minimum of time.

The production of a special mail aeroplane, on the lines laid down in the Air Ministry specifications which we published earlier in the year, should put an end to the interest now taken in record flights by light aeroplanes between England and Australia. When that machine is produced it will presumably be tried out by Imperial Airways, and they, naturally, will use the relay system described above. Sections of the route will before long be organised for night flying. Neither pilot nor engine will undergo any risk of being run to a standstill. Then we shall be able to get letters to Australia in really fast time. What the minimum time will ultimately be we cannot say. Officials have talked about 10 or 11 days. Obviously, that is too long. If a single Gipsy Moth, with a single pilot, can do the journey in about nine days, the relays of special mail aeroplanes, backed by experienced organisation, should be able to get our letters through in a time which not long ago seemed quite beyond the bounds of possibility.

The launch of the United States naval airship "Akron" is an event to which all airship enthusiasts have been eagerly looking forward for a long time. She is the largest airship ever designed, and so marks a great step forward in the airship experiment. We, in Great Britain, are still suffering from the depression caused by the tragic loss of R101, and still are hardly in the proper frame of mind to take a calm view of the experiment. The world, however, has not done with airships. Great Britain has had a calamitous set-back, but the United States and Germany are pushing ahead, undisturbed by the shock from which we are suffering. It is unfortunate for them, as well as for us, that not very much operational experience has been gained by the great constructional experiment which Great Britain undertook. The return voyage of R100 across the Atlantic taught certain lessons, and the loss of R101 taught at least one lesson, namely, that too great structure weight may be a fatal fault. It would have been an advantage for the Americans if these lessons could have been digested before the design of the "Akron" was begun; but we can hardly blame them for making an independent experiment. The "Akron," accordingly, emerges from her shed as a new experiment in the building of large rigids, not as the result of previous experience of the same kind. Being an experimental craft, she will doubtless develop the teething troubles which are to be expected from all new types of aircraft. When these are manifested, we must not be in a hurry to judge the designers too harshly. They have to learn by experience, as the early designers of all types of transport vehicles have had to learn. It is reported that the "Akron," like the R101, has come out heavier than was intended. Admiral Moffett, chief of the American naval air service, is reported to have said that "The slight excess in her weight, as originally estimated by the contractor, is a direct conversion into increased safety and military factors."

The "Akron" has the great advantage that she is inflated with helium. She will not catch fire. In the case of the "Shenandoah," helium proved somewhat of a snare. The fear of losing the expensive gas rather hampered the captain in manœuvring his ship, and, finally, the reduction of the number of valves caused her to break up when she got into a dangerous line squall. We may feel sure that similar mistakes will not be made again. The "Akron's" engines, it is true, have swivelling propellers, but Major Scott always held that these could not take effect quickly enough to save a ship when in violent vertical currents. Whether the extra complication will prove worth while in ordinary manœuvre remains to be seen.

An important point about the "Akron" is that she is a naval airship. It seems that naval airships and commercial airships are two very different matters. We have still to prove whether the commercial airship will be able to pay its way. There seems very little doubt that the naval airship will be an indispensable adjunct to the cruiser fleet of any great maritime Power.





A VICKERS-SUPERMARINE ROLLS-ROYCE S.6.B.: This seaplane, S1595, is the first of the two new racers to be delivered to the High Speed Flight at Calshot. The other, S1596, was delivered on August 11. (FLIGHT Photo.)



This side view shows that the robustness common to all Avro aircraft has not been sacrificed although exceptionally clean lines have been obtained.

AN AVRO MAIL PLANE

AL. V. ROE & CO., LTD., of Manchester, have just produced one of the first aircraft specially designed in this country for carrying air mails. This is undoubtedly a step in the right direction, particularly as the Avro 627, as it is called, has been built with the specific purpose of catering for Canadian desires.

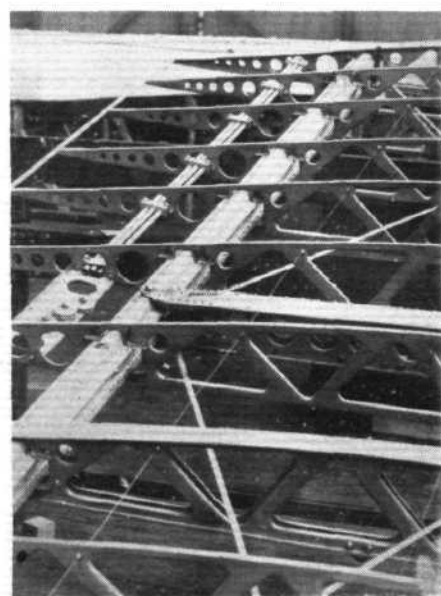
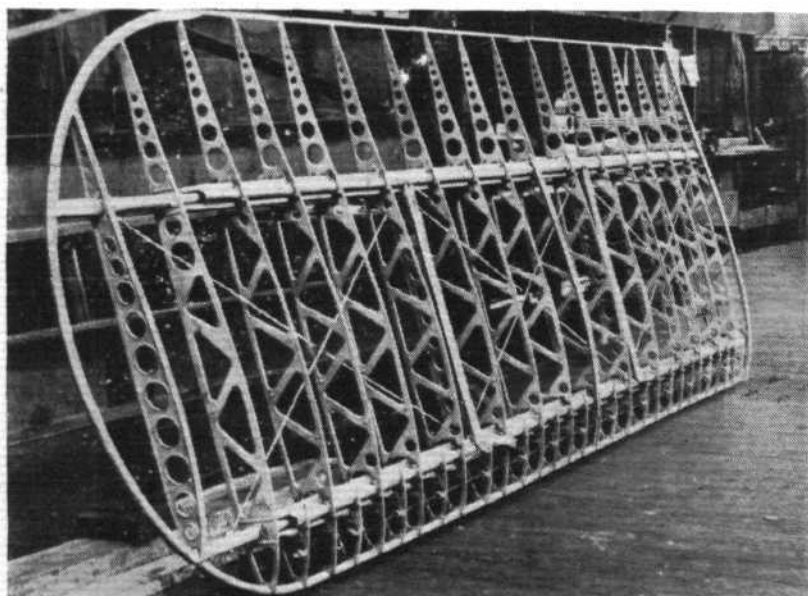
In its essentials it is reminiscent of the Antelope, but in detail it varies very considerably. From first to last, Mr. Chadwick, the firm's Chief Designer, has worked in co-operation with the Canadian Government officials and those of Canadian Airways, Ltd., the result being that the 627 can definitely be said to represent the type of machine which Canada wants. She is probably not so fast as some of the mail-carrying aircraft used in the United States of America, but undoubtedly satisfies the desiderata of those who will use her, to a far better extent, than the American craft. The construction throughout is of metal, and every precaution has been taken to make her safe, comfortable, and easy to fly in bad and exceptionally cold weather. As befits a modern production, the whole undercarriage can easily be changed for skis or floats, and full

night-flying equipment is, of course, fitted. The engine installation includes an electric inertia starter and an engine-driven electric generator. The mail compartment is built up in the manner of our fireproof bulkheads, with asbestos sheeting sandwiched between duralumin plates. A summary of the main conditions which the machine has been designed to fulfil would be high cruising speed, some 600-mile range in still air, ease of maintenance, ease of transport of all replaceable components, and complete equipment for comfortable and regular operation of air-mail services under Canadian conditions.

Fuselage

Following the now accepted Avro practice, the Type 627 fuselage is of welded steel tubing. The main frame is divided into three sections, consisting of the engine mounting, which is of the straightforward tubular type, the middle section, which includes the mail compartment and the pilot's cockpit, and the rear section continuing from behind the pilot to the stern post. As far aft as the pilot's cockpit the fuselage is tubular strut braced, while the rear section is wire braced. Directly behind the engine

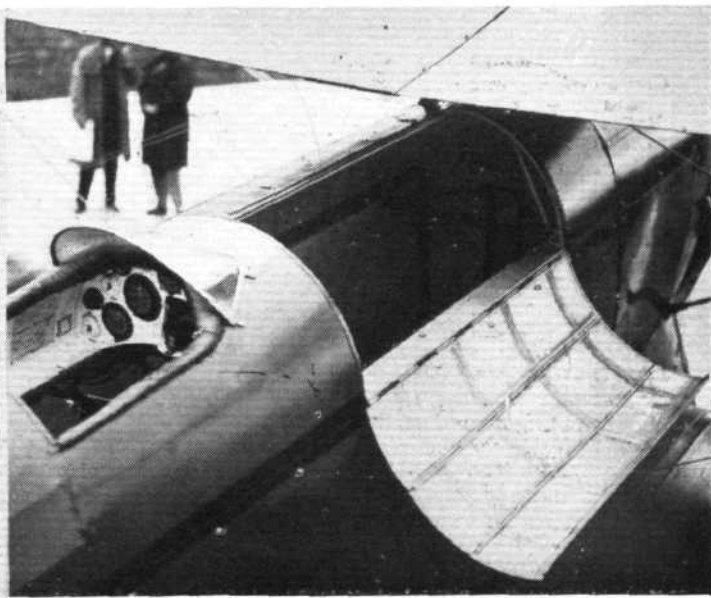
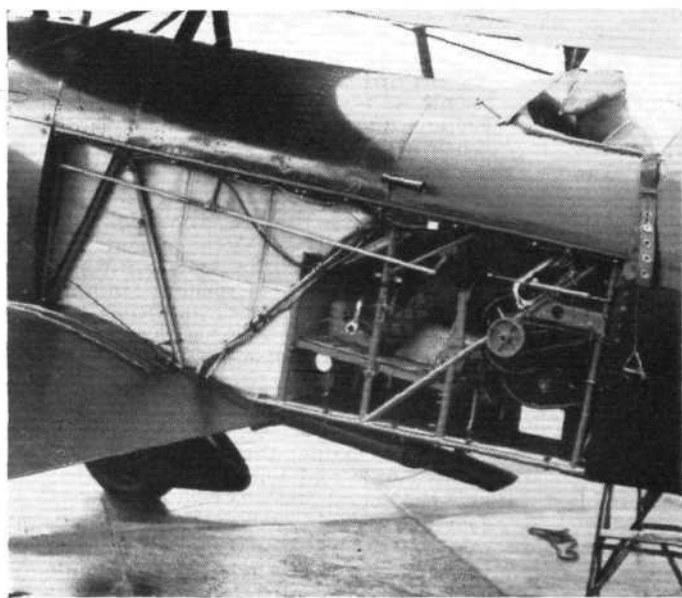
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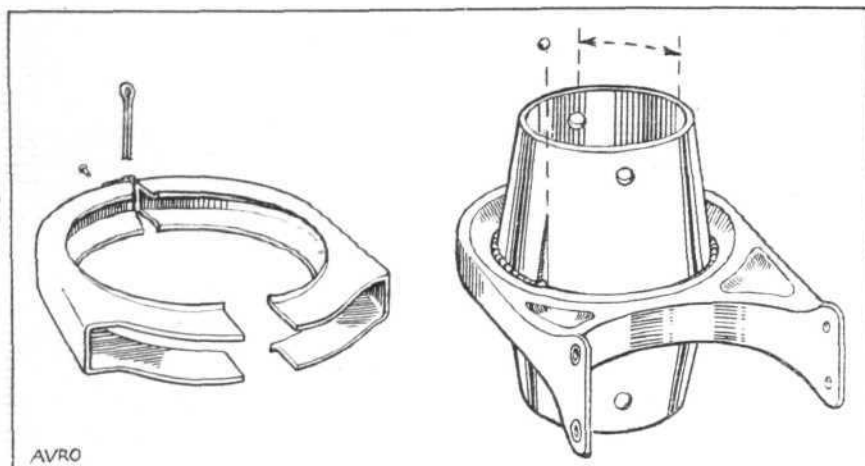
WING DETAILS: The strip steel spars and duralumin ribs exemplify Avro workmanship.



The clean lines and low head resistance, in spite of the large radial engine fitted to the Avro "627" are well depicted in the above photographs. The attention which has been paid to the reduction of drag can be seen on the right by the double form of Townend Ring and the "spats" over the wheels. (FLIGHT Photos.)



The side panels of the fuselage may be quickly and easily detached to expose all pipes and control rods for adjustment and maintenance. On the right our photograph shows the mail compartment with the lid open. This lid folds again twice and so does not impede loading up of the compartment. (FLIGHT Photos.)



AVRO "MAILPLANE" TYPE 627.

(Armstrong-Siddeley "Jaguar Major." 525 h.p. at 2,000 r.p.m. at 3,000 ft. (914.4 m.). Gear ratio 1:0:0.657.)

PERFORMANCE WITH FULL LOAD (Within 2½ per cent. in speed and 5 per cent. in climb.)

SPEED.—

Maximum speed at sea level	170 m.p.h. (273.6 km.p.h.)
" " 3,000 ft. (914.4 m.)	170 m.p.h. (273.6 km.p.h.)
" " 5,000 ft. (1 524.0 m.)	168 m.p.h. (270.5 km.p.h.)
" " 10,000 ft. (3 048.0 m.)	160 m.p.h. (257.5 km.p.h.)
" " 15,000 ft. (4 572.0 m.)	149 m.p.h. (239.8 km.p.h.)
Landing speed	66 m.p.h. (106.2 km.p.h.)

Cruising speed at 3,000 ft. (914.4 m.) at three-quarters normal power 147 m.p.h. (236.6 km.p.h.)

Duration at 147 m.p.h. (236.6 km.p.h.) .. 3.8 hr.
560 miles (901.2 km.)

Cruising speed at 3,000 ft. (914.4 m.) at two-thirds normal power 140 m.p.h. (225.3 km.p.h.)

Duration at 140 m.p.h. (225.3 km.p.h.) .. 4.3 hr.
600 miles (965.6 km.)

CLIMB.—

Rate of climb at sea level	1,200 ft./min. (6.1 m./sec.)
Time to 1,000 ft. (304.8 m.)	0.83 min.
" 5,000 ft. (1 524.0 m.)	4.30 min.
" 10,000 ft. (3 048.0 m.)	10.50 min.
" 15,000 ft. (4 572.0 m.)	23.00 min.
Service ceiling	17,500 ft. (5 334.0 m.)
Absolute ceiling	19,000 ft. (5 791.2 m.)

DIMENSIONS.—

Span of top wings	36 ft. 0 in. (11.0 m.)
Span of bottom wings	32 ft. 0 in. (9.7 m.)
Span of tail plane	12 ft. 0 in. (3.6 m.)
Height overall	10 ft. 6 in. (3.2 m.)
Length overall	30 ft. 10 in. (9.4 m.)
Chord of top wing	7 ft. 0 in. (2.1 m.)
Chord of bottom wing	5 ft. 0 in. (1.5 m.)
Gap between wings	5 ft. 4 in. (1.6 m.)
Chord of tail plane	4 ft. 3 in. (1.2 m.)

AREAS.—

Main planes with ailerons	381.0 sq. ft. (35.39 m².)
Ailerons only	32.0 sq. ft. (2.97 m².)
Tail planes	24.7 sq. ft. (2.39 m².)
Elevators	16.8 sq. ft. (1.56 m².)
Rudder	16.0 sq. ft. (1.48 m².)
Fin	5.0 sq. ft. (0.46 m².)

WEIGHTS.—

Weight of aircraft, light	3,077 lb. (1 395.7 kg.)
Electric starting gear	17 lb. (7.7 kg.)
Engine driven generator and drive	25 lb. (11.3 kg.)
Accumulator (starting, lighting and W/T)	39 lb. (17.7 kg.)
Navigation lights and wiring	6 lb. (2.7 kg.)
Landing light gear and wiring	22 lb. (10.0 kg.)
Radio Beacon receiver W/T	32 lb. (14.5 kg.)
	141 lb. (63.9 kg.)

Tare weight of aircraft with all equipment .. 3,218 lb. (1 459.6 kg.)

Pilot with parachute 190 lb. (86.2 kg.)

Fuel (100 gall.) (454.6 l.) 765 lb. (347.0 kg.)

Oil (10.7 gall.) (48.6 l.) 107 lb. (48.5 kg.)

1 062 lb. (481.7 kg.)

Maximum mail load 870 lb. (394.6 kg.)

GROSS WEIGHT FULLY LOADED 5,150 lb. (2 335.9 kg.)

ON BALL BEARINGS: The aileron and elevator hinges are of the ball bearing type, and are not divided, the balls being put into the bearing at the coincidence of a groove in the centre sleeve and a notch in the outer race.

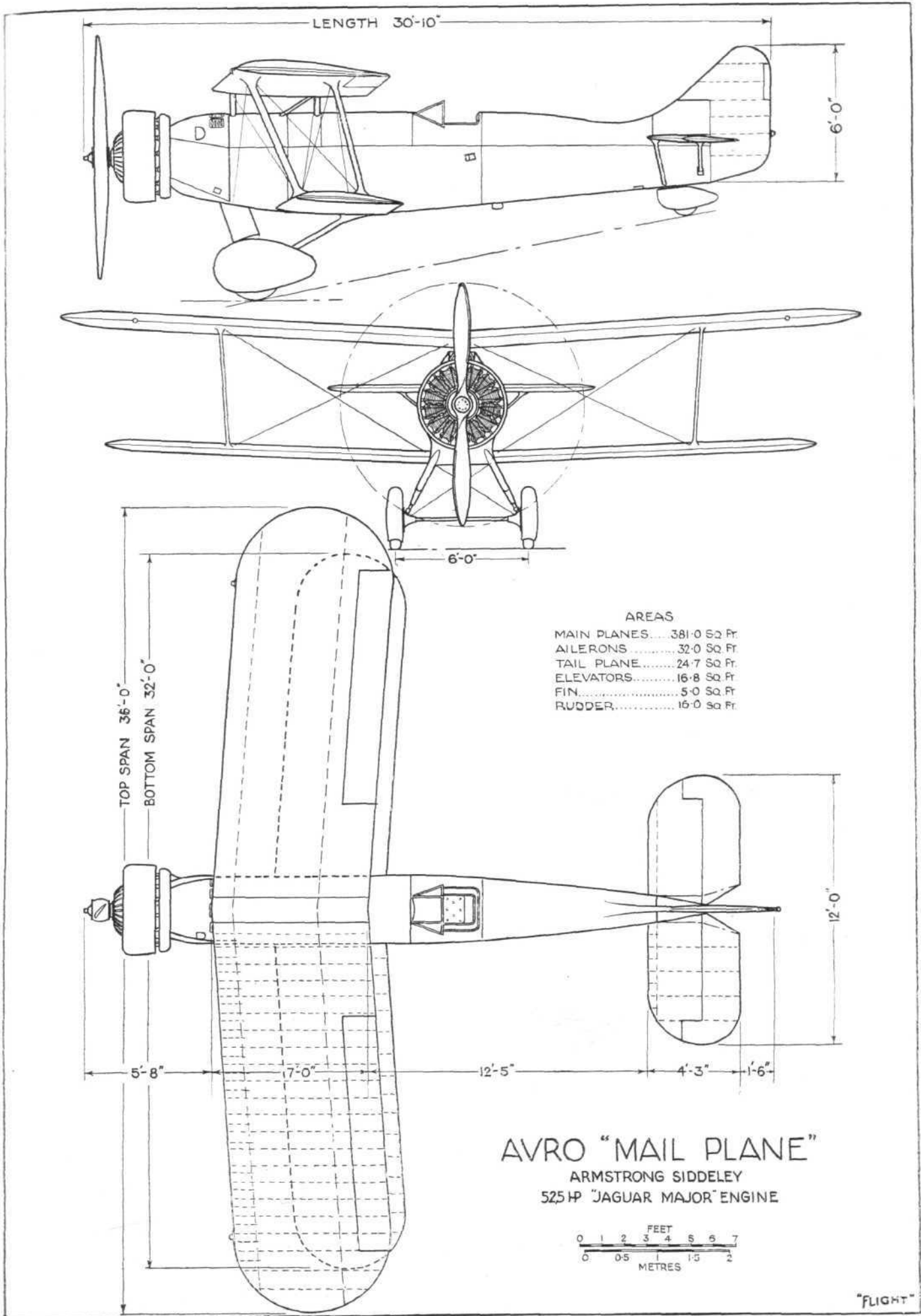
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mounting is the section carrying the two fuel tanks, having a large rectangular one in the middle slung on steel straps, with a shaped gravity tank above it. Aft of this is the mail compartment, which is completely lined with duralumin-asbestos-duralumin, and provides 40 cubic ft. of clear space inside it. A folding lid of the same material opens towards the starboard side of the machine, and provides a large-size entrance for loading. This half of the lid is further divided into halves, so as to incommode the loading operation as little as possible.

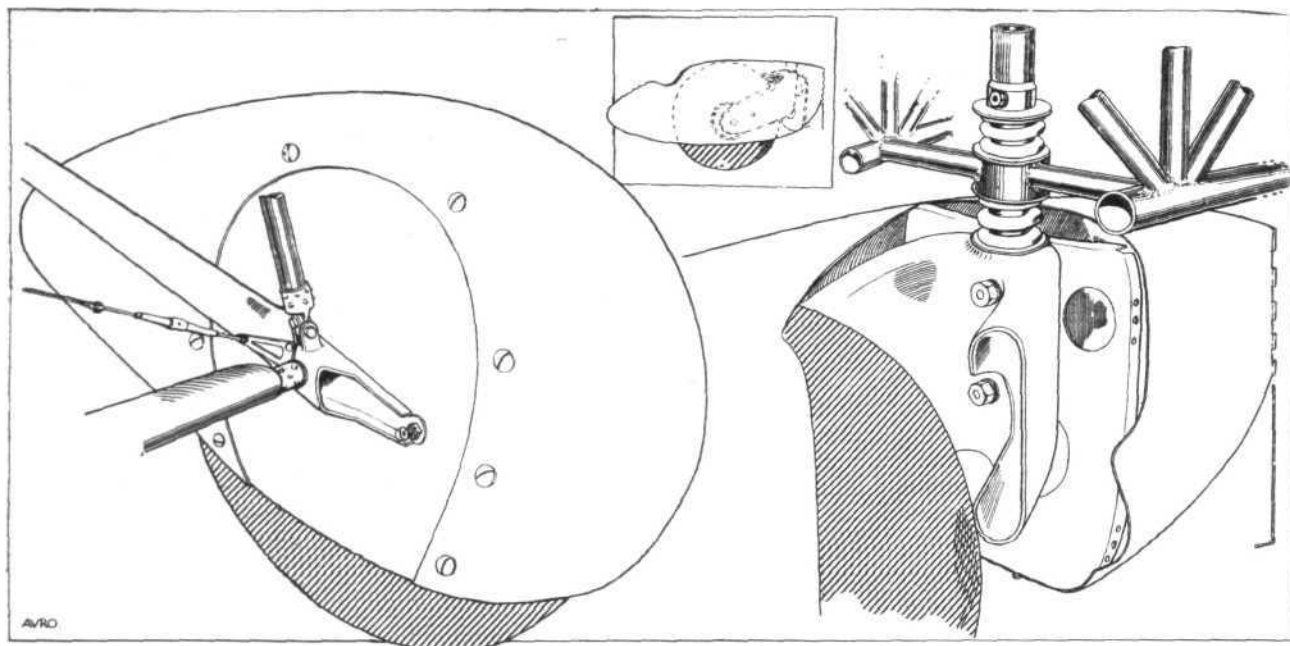
Directly behind the mail compartment is the pilot's cockpit, and, being situated thus far aft, the pilot should have an excellent view in all directions; moreover, his position should make him very safe and give him every chance of surviving in the event of a crash. No pains have been spared to make the pilot's job as comfortable as possible, so that long-distance flights should present no difficulty.

The seat is adjustable in the same manner as in the Avro Tutor, the operating lever being situated on the right-hand side, the handle part of this lever being, as are all the other handles and levers in the cockpit "Doverised," in order that the pilot should have no trouble through touching cold metal in very low temperatures.

The rudder bar is easily adjustable in flight by means of a small hand wheel mounted directly in line with the pivot, in the same manner as other Avro machines. In the standard position, on the port side of the cockpit, is a wheel for adjusting the tail plane; a refinement is an indicator for showing the tail setting. All fuel system controls are situated on the right-hand side of the cockpit, enabling either or both tanks to be connected direct to the carburettor, and there is also a lever to a hand-worked Vickers pump for use in case the engine pump breaks down. Landing lights, which are fitted in the bottom wings, can be swung down to the landing position by means of another control, and another lever on the same side opens or closes louvres in the engine cowling to regulate the engine temperature. Cockpit heating is provided direct from the exhaust, with openings under either heel board, thus keeping the pilot's feet warm, as well as heating the cockpit. Special instruments include a Pioneer bank and turn indicator, and a climb indicator, a button on the dashboard controlling the Eclipse electric inertia starter. Arrangements are also made for releasing the American-type parachute flares for emergency landing. A receiver for the Western Electric radio beacon is situated on the floor behind the pilot's seat. Following the usual Avro practice, the side fairings of this part of the fuselage are built up of spruce and three-ply, in complete frames, which are easily detachable, thus readily exposing all control rods and wires, which are led outside the actual fuselage frame, when desired, leaving the inside of the cockpit absolutely clean. The front cowling panels just aft of the engine are aluminium, well shaped to work in harmony with the engine cowling and keep the drag of this large-sized fuselage as low as possible. The engine cowling itself will be of the Townend ring type, which should contribute a great deal to the high performance.



THE AVRO "MAIL PLANE": General arrangement drawings.



WHEEL DETAILS: On the left the sketch shows the method of attaching the streamline fairing over the landing wheels, while on the right the tail wheel and its springing is shown. The hollow steel fork carrying the wheel (see small sketch) is shown cut through in order that the method of attaching the fairing to a transverse plate may be understood.

Main Planes

The main planes and interplane struts are constructed of metal, the spars being of high tensile corrugated strip steel and the ribs, duralumin pressings. The drag bracing is effected with built-up girder-type compression struts and cross bracing wires. The ailerons, which are balanced on the Frise principle, are only fitted to the top plane, which is considerably larger in area than the bottom, and is placed low so that the pilot's eye is almost on a level with it, giving him a good view and presenting a minimum of obstruction to his vision. The bottom plane is also staggered with regard to the top, and thus gives the pilot an excellent forward and down view, besides increasing the efficiency of both wings. The aerofoil section used is a special one designed to give a very nearly stationary centre of pressure, and has already been tested out in full scale with excellent results.

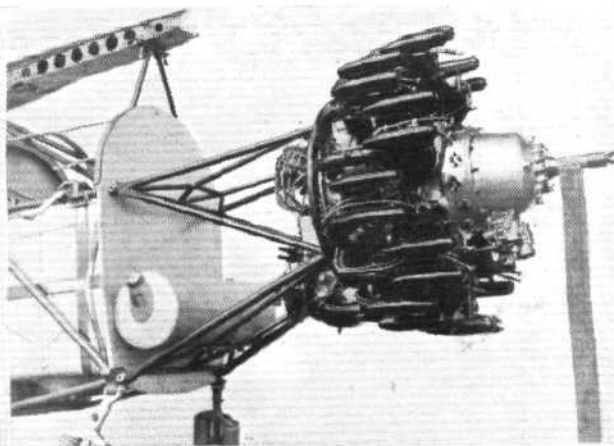
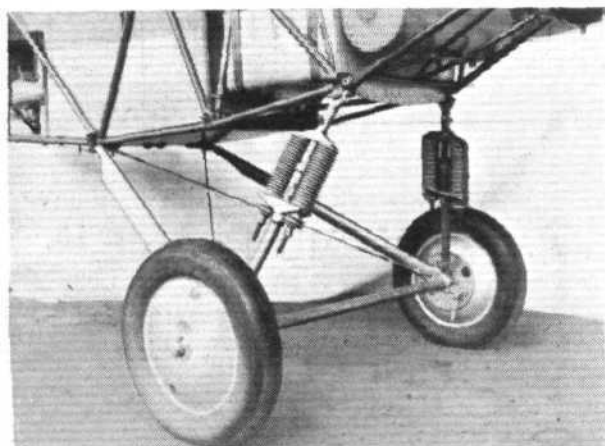
The interplane struts, as already mentioned, are steel and of streamline cross-section tube, the cross bracing being the normal streamline wire type. The designers have adhered to the biplane type of construction for this machine, in view of the fact that they consider it necessary, firstly, to keep down the overall dimensions of the aircraft and also to make transport of replacement parts as easy as possible. The lower wing in particular, which is the one most likely to be damaged, is so small that it can be transported with great ease, and a new one fitted to the machine with a minimum of trouble.

The Tail Unit

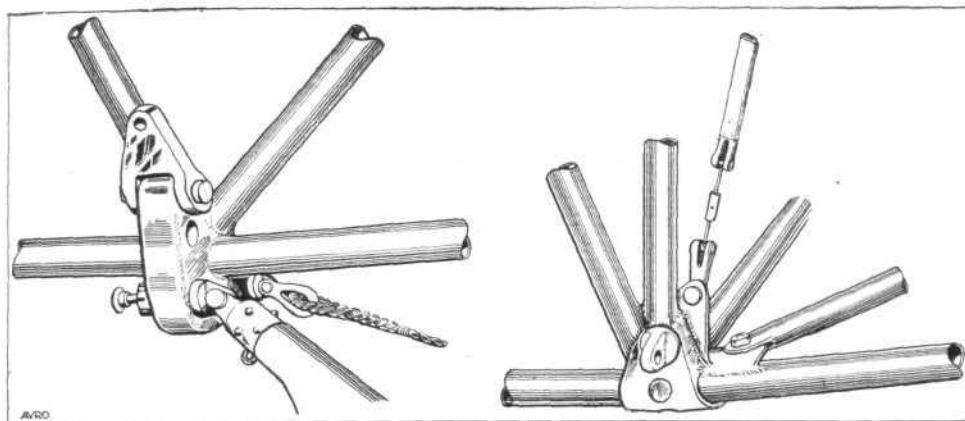
All the tail surfaces are of welded steel tubular construction, with both the rudder and elevators balanced aerodynamically, the elevators also being balanced statically, like the ailerons. Both these surfaces are mounted on ball bearings of large size, making operation both smooth and easy. The rudder and fin are unbraced, but the tail plane, which is provided with incidence adjustment of the usual Avro screw type worked from the pilot's cockpit, has two streamline tubular steel struts on each side. The front spar fittings also provide additional adjustment, which can be operated on the ground. The lower planes have hinged landing lights fitted to them, operated from the pilot's cockpit by wires, which allow them to be withdrawn up into the wing out of the air stream when not in use. The elevators are operated by means of a push and pull rod, which has two universal joints in it to allow of free movement. In order to make dismantling the tail plane a simple matter, this rod also has a ball coupling, with a neat type of locking ring which can very readily be disconnected. The ailerons and rudder are worked in a normal manner by cables.

Undercarriage

The undercarriage is straightforward and simple, with a cross axle, streamlined section tube radius rods, and compression legs, combining an oleo cylinder and rubber discs for shock absorbing. The oleo cylinder provides a



THE UNDERCARRIAGE AND ENGINE MOUNTING: Simplicity with efficiency has obviously been maintained throughout in constructing the Avro 627, as the details of both the undercarriage and the engine mounting will show.



TWO IMPORTANT JOINTS: That on the left takes the front pair of flying wires and that on the right the front spar of the bottom plane on the Avro "627."

free travel of some 8 in., thus giving exceptionally good shock-absorbing qualities. Dunlop disc wheels with Bendix brakes are fitted as standard, the brake torque being taken directly through the radius rod. The wheels themselves, and also the balloon-type tail wheel, are covered with beaten aluminium streamline fairings. Attachment points are provided so that either a twin-float or ski undercarriage may easily be substituted for the standard land undercarriage. The tail wheel is of the free type, providing castor action, with small centralising springs of shock-absorbing cord. The wheel is mounted in a welded sheet-steel fork, which is carried on a post sprung with small stiff springs, the main shock being taken by the balloon tyre, which is a low-pressure Goodyear.

The Power Installation

The engine mounting is a triangulated welded-up steel tube structure, terminating in a ring to which the engine is mounted in front, and four attachment points on the after end, which are bolted to machined steel fittings on the fuselage. The oil tank is placed in front of the fireproof bulkhead, and lies inside the engine mounting. A unique feature of the power plant is the fitting of an Eclipse Electric Inertia Starter, and the provision of direct drive for the electric generator. The starter may also be worked by hand, for which purpose a hand lever is provided. The engine is an Armstrong-Siddeley "Jaguar Major" of 525 b.h.p. at 2,000 r.p.m., fitted with a geared airscrew running at 0.657 crankshaft speed. The engine is also fitted with a geared fan, maintaining ground level power up to 3,000 ft.

Fuel tankage is provided for 100 galls., there being 72 galls. in the main tank, which is situated directly behind the fireproof bulkhead, and 28 galls. in the gravity tank above it. Both tanks are built up of welded aluminium sheet of some 16 gauge, thus providing both lightness and strength. The main tank is slung in leather-covered steel straps, and may be removed for repair through the bottom of the fuselage, when necessary. The gravity tank sits on bearers on the top of the fuselage, and is constructed with the diagonal bracing struts of the top centre section, passing through grooves each side

of it. The gravity tank has a direct reading contents gauge, and fuel is passed to it from the main tank by the engine-driven pump, which is fitted as standard for emergency use. There is, however, also a hand-worked Vickers pump.

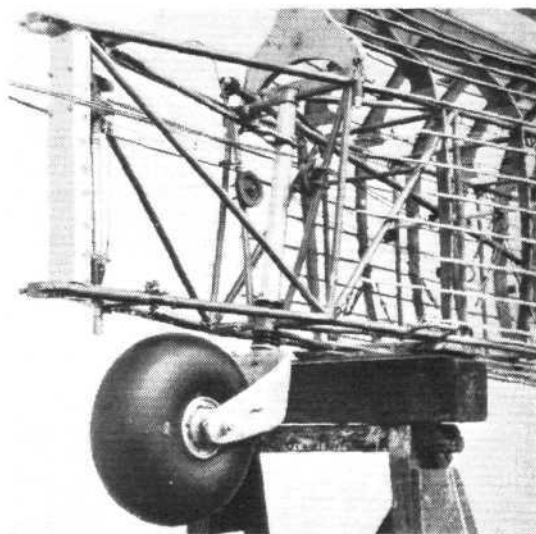
The oil tank, which, as we have already mentioned, is in the engine mounting, is of cylindrical form, and also constructed of aluminium. Its capacity is 11 galls. One end of it has a special large-diameter drain cock, so that the contents may be emptied quickly and heated before use when operating the aircraft in very cold climates.

A Vickers-Potts oil cooler is used with a bye-pass, so that it may be cut out of the oil circuit when conditions are particularly cold. The exhaust manifold, placed behind the engine, is of streamline section, with a long tail pipe carried below the pilot's cockpit, and, being in the form of a ring, is designed to work in conjunction with the Townend ring engine cowling. The tail pipe finishes right aft of the pilot's cockpit, and, by means of a muff, supplies air through suitable ducts into the cockpit, the outlets being at the front end of each footboard. A control handle is fitted on the right-hand side of the cockpit for regulating the supply of warm air.

On Monday, August 10, the "627" was flown at Heston before Col. Sheppard, the Director of Civil Aviation. In its finished state, and painted brilliant yellow, it makes an imposing aircraft. Its take-off appeared good, as did its top speed. Particularly impressive was the ease with which it could be manoeuvred on the ground without extraneous help.

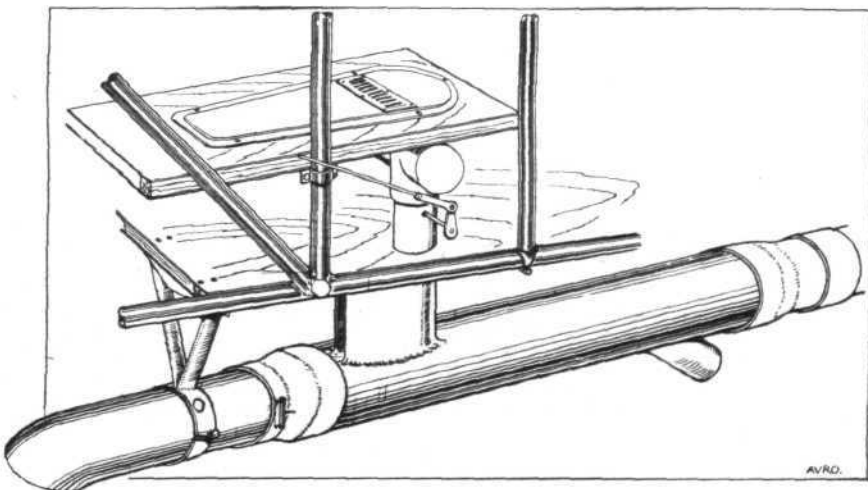
The modern arrangement of swivelling tail-wheel together with efficient wheel brakes certainly makes the aircraft nearly as handy on the ground as a motor-car.

Taken all round, this aircraft would appear to fill the needs of the Canadian market in an admirable manner, that is assuming that a cruising of not more than 147 m.p.h. is what is required, and it undoubtedly provides one of the best equipped and most comfortable cockpits for the pilot that we have seen.



THE TAIL WHEEL: The construction of the tail wheel springing can be seen here as well as the tail-plane incidence gear.

THE HEATING SYSTEM: The hot air is brought in under the foot boards from a muff round the exhaust pipe, and the supply is controlled by a butterfly valve.



MOLLISON BEATS SCOTT

Australia to England in
211 Hours 25 Minutes

FROM the confusion which exists owing to the difference in time between England and Australia, and also because the amount by which each fresh "record" beats the previous grows smaller and smaller, it would appear that the time has come to speak of the Australia-England "record" as having been reduced to so many hours instead of days. When Ross Smith first made the flight from England to Australia, in 1919, he took a fairly long time over it, and his successors only had to beat him by a week or so to be doing pretty well. But when one Bert Hinkler took it into his head to do the flight in 15½ days or so, it became obvious that the "record" was not to be measured by a tear-off calendar, but required at the very least a decent pocket watch. Then Kingsford Smith reduced the time from Australia to England to 12 days 14 hours, and recently C. W. A. Scott reduced that to 10 days 23 hours. And now Mollison has managed to cut it down to less than 9 days. For the next man (or woman) who lops something more off the time a stop watch will be needed to be certain the "record" really has been broken. The obvious measure of the time between Australia and England is the hour, and on that basis Mollison has beaten Scott by 50 hours. On his outward journey earlier this year Scott took 220 hours 11 minutes, so that even this "record" has been beaten by Mollison by his recent homeward trip, with a margin of over 8 hours.

Mr. J. A. Mollison, flying a De Havilland Gipsy Moth, left Sydney for Wyndham on July 25. His attempt on the "record" actually began when he left Wyndham on Wednesday, July 29. The time was 1 a.m. local time, so that it was still Tuesday in England, and 5 p.m.



THE OFFICIAL WELCOME: Mr. J. A. Mollison was greeted on his arrival at Croydon by Mr. F. Montague, Under-Secretary of State for Air.

Greenwich Mean Time to wit, the time-difference between Wyndham and London being 8 hours exactly. Therefore, if Mollison had reached England at 5 p.m. G.M.T. on Thursday, August 6, he would have taken exactly 9 days, or 216 hours. Actually, he landed on the beach at Pevensey at 1.25 p.m. B.S.T., or 12.25 G.M.T., having completed the journey in a lapsed time of 8 days 19 hours 25 minutes, or 211 hours 25 minutes.

Of the flight itself, there is little to say. It was accomplished in record time because the Gipsy engine kept on running, because Mollison's navigation was good, and because he went practically without sleep and did a good deal of night flying. As has been known to happen before, Lord Wakefield made the flight financially possible, thus once more helping to bring British aviation before the eyes of the world.

On a flight of this sort every piece of equipment and every accessory counts for a great deal, and, doubtless, Mollison was heartened in his night journeys by the fact that his Gipsy engine was fitted with K.L.G. plugs.



THE END OF A STRENUOUS FLIGHT: Mr. Mollison arrives at Croydon on his Gipsy-Moth after flying from Australia to England in 8 days 19 hours 25 minutes.

SCHNEIDER CONTEST, 1931

THE Royal Aero Club announces that, after consultation with the Air Ministry and Admiralty, it has been decided that this year the Schneider Trophy Contest shall be competed for over a triangular course over the Solent and Spithead on September 12, with the turning points in the following positions:

The western pylon will be on the Ryde Middle, the southern pylon will be off St. Helen's Point, and the eastern pylon on the foreshore of the eastern side of Chichester Harbour.

This circuit provides a course of 50 kilometres (26.98 sea miles, or 31.07 land miles), and will be flown round anti-clockwise seven times, the speed contest, therefore, being over a distance of 350 kilometres (188.86 sea miles, or 217.47 land miles). The Club has decided on this course after the most careful consideration of all the factors involved.

For the safe operation of high-speed seaplanes such as compete in the Schneider Trophy Contest, it is essential that the waters on which they operate shall be calm and protected with suitable tidal conditions, and an investigation of other localities in the British Isles has shown that the Solent and Spithead is the only place which provides a sufficient expanse of protected water with the requisite conditions, and at the same time is easily reached by spectators both in England and from abroad. Furthermore, the locality lends itself to the efficient organisation and conduct of the contest owing to the immediate proximity of the naval port of Portsmouth and the Royal Air Force Base at Calshot. The work of marking the course with buoys, providing destroyers for the two seaborne pylons, allocating and supervising the berthing areas for yachts, etc., and the patrolling of the course is all undertaken by the Royal Navy, and Calshot Air Station is eminently suited for the accommodation of the competing teams, who have to be based close to the scene of the contest for some time beforehand in order to obtain the necessary practice over the actual course to be flown.

This year's contest differs from that held in 1929, in that the "preliminary trials" immediately precede the speed tests and form part of one continuous contest. The preliminary trials consist of a take-off, a climb to approximately 150 feet, a landing and taxiing test of about two minutes' duration. The competitor then proceeds direct to the starting line and enters the speed course.

In the interests of safety, it is essential that the area where the preliminary trials take place shall not be overlapped by the speed course. Whilst racing, the aircraft fly at a comparatively low height, at times as low as 100 or 150 feet, and a risk of collision would exist were they to pass over the same area as that in which the aircraft are taking off and landing in the preliminary trials. The most suitable expanse of water of sufficient size for the preliminary trials is that stretch of water south of the entrance to Southampton Water off Calshot Castle; east

of Gurnard Bay and Stone Point; and west of the Ryde Middle. This area, therefore, will be reserved for these trials and for the landing of each aircraft after completion of the contest. The unrestricted use of this water has been made possible by the co-operation of the shipping companies and the Southampton Harbour Board, who have generously agreed to adapt the sailings of all ships on September 12, so that both this area and the course itself shall be free of shipping between 12.30 p.m. and 4 p.m. The port of Southampton will, therefore, be closed during these hours.

In order to leave the preliminary trial area clear, it has been necessary to plot the speed course to the east of it, and the triangular course chosen is that which, whilst affording the best course from a flying point of view, also gives the public an admirable view from several points of vantage. In 1929 a quadrilateral course was chosen, but, with the increasing speed of racing aircraft, a triangular course is preferable, as the legs are longer and the pilots have only to find three pylons instead of four.

The pylon on the foreshore is easily found by the pilots, since it is close to the entrance to Chichester Harbour, and the harbour itself at high tide would provide an expanse of water for an emergency landing in the event of an engine failure on the turn. It will also be observed from a glance at the chart that the turning point off St. Helen's Point is also easily found, since it is in a direct line between the Ryde Middle pylon and the conspicuous Nab Tower to the south-east.

Experience in 1929 has shown that Ryde pier provides admirable facilities as a starting and finishing line. It enables the aircraft, after completing the preliminary trials, to enter straight on to the left-handed course without crossing it, and the communication facilities are sufficient for all purposes.

The contest has been timed to begin at 12.30 p.m., in order to obtain the best tidal conditions. Between the hours of 12.30 and 4 p.m. there will be plenty of water over all the sand banks and in Chichester Harbour, and conditions will be practically identical for both the first aircraft to start and the last. In the event of postponement owing to bad weather, the time of starting may have to be advanced, the hour depending upon the day on which the contest is held.

GENERAL REGULATIONS

1.—The Contest will take place on Saturday, September 12. Particulars of the Preliminary Trial Area and Speed Course are shown on the attached Official Chart.

2.—The competing aircraft shall be at the position designated by the Clerk of the Course near the starting ship, H.M.S. *Medea*, in time for the start of the first competitor at 12.30 hours.

3.—The first competitor will be started at 12.30 hours, and the other competitors at intervals of 15 minutes thereafter. In the event of any competitor retiring from the Contest, the time of departure of subsequent competitors may be advanced and all competitors shall be held to be prepared for such advance.

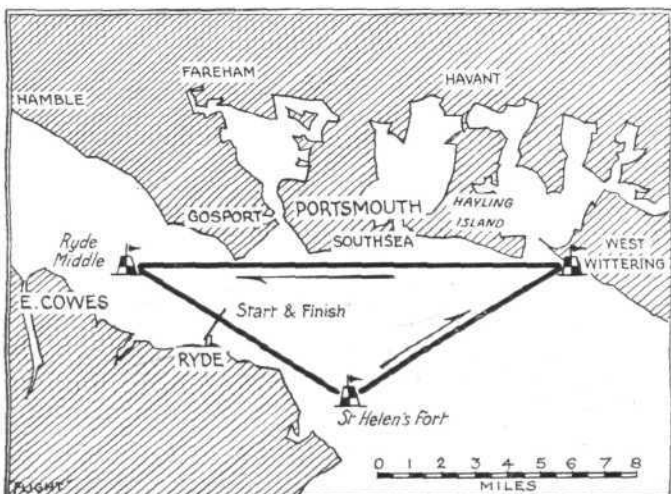
4.—The order of starting of the first competitor of each team will be drawn by lot prior to the day of the Contest. The sequence drawn for the first of each team will be followed for the second and third of each team.

5.—Each competitor will be started by a signal gun from the starting ship. Five minutes before the firing of each gun a preparative flag signal will be hoisted. One national flag will indicate the forthcoming start of the first competitor of a team, two flags the second and three flags the third. Each flag hoist will be hauled down simultaneously with the firing of the gun.

6.—Each competitor will be allowed 30 minutes in which to carry out the preliminary trials as defined in rules 12, 13 and 14.

7.—If a competitor is still within the defined preliminary trial area at the expiration of 15 minutes from his start he must give right of way to the next competitor started.

8.—If a competitor has not succeeded in carrying out the preliminary trials and in leaving the defined preliminary trial area within the 30 minutes allowed, he will be deemed to have failed and must retire from the Contest and leave the trial area as expeditiously as possible.



THE SCHNEIDER CONTEST: Sketch Map of the 1931 Course. Note that the Eastern Turning Point is on land.

9.—On completion of the Contest competitors should endeavour to land within the area reserved for that purpose. This area will be notified on the day of the Contest according to the direction of the wind.

10.—In case of unfavourable weather the Stewards will have the right to postpone the Contest as often as they think fit.

The Preliminary Trials

11.—After the starting signal has been given the competitor will take off, climb to approximately 50 metres and land within the preliminary trial area—coloured green on the Official Chart. This landing will be followed by a taxiing test on completion of which the competitor will proceed to the starting line of the speed course.

12.—The landing referred to in rule 11 above will be deemed to have been effected at that moment when the aircraft first touches the water in the process of becoming water-borne.

13.—From the moment of the landing as defined in rule 12 the competitor must taxi his aircraft for about two minutes. The period of acceleration on the water prior to taking off to enter the speed course may be included in the taxiing trial.

14.—No repairs, modifications or refuelling will be permitted during the preliminary trials up to the moment when the competitor crosses the starting line of the speed course. In the event of an engine stopping, the aircraft

may be towed and the engine restarted providing this can be effected within the time prescribed in rule 6.

The Speed Test

15.—Each competitor who crosses the starting line within 30 minutes of his starting gun will be timed as from the moment of crossing. If the competitor has not succeeded in crossing the starting line at the expiration of 30 minutes from his starting gun, his time for the speed test will commence at the expiration of the 30 minutes, providing always that he has not been disqualified under rule 8.

16.—The starting line may be crossed as the competitor chooses either by taxiing over it or by passing over it in flight. The finishing line must be crossed in flight.

17.—In order to discourage diving on to the course, competitors must not approach the starting line from a height greater than one thousand feet.

18.—The course will be flown anti-clockwise, and competitors must pass round each Turning Point, leaving it on their left.

In order that the observers on the Turning Points may check the correctness of the circuits, competitors are advised not to round the Turning Points at heights exceeding five hundred feet.

19.—Intermediary landings and repairs are permitted during the speed test.

20.—The Stewards shall have the right to disqualify any competitor who in their opinion infringes any of the above rules.

A VISIT TO CALSHOT

EVEN though Great Britain is defending the Schneider Trophy with machines of the type Supermarine Rolls Royce S.6, which was used in 1929, these machines have been considerably altered in every respect except appearance, and so a visit to Calshot air station was a very interesting experience. The station was opened to the Press on Tuesday, August 11, and the firms of Rolls Royce and Vickers-Supermarine were hosts on the occasion to a large party of journalists and others, and entertained them with the complete hospitality for which both firms are famous. As the wintry storms of the previous day had passed, and a very fair imitation of summer prevailed during the visit, the occasion was entirely delightful.

The decks of Calshot have been cleared for action. The flying-boat squadron has departed to Stanraer, and the school which gives instruction in boat work has also been banished. Group Captain Nanson and Air Vice-Marshal Sir Charles Lambe gazed upon a Base given over almost entirely to the High Speed Flight. The Group Captain admitted that he had a "Southampton" or two up his sleeve. Three huge hangars displayed the national flags of the three competing nations, Great Britain, Italy, and France. On the tarmac and the slipways stood a selection of racing and practice seaplanes. Side by side stood N.247 (the 1929 winner and the holder of the world's speed record) and S.1595, the first of the two new machines. N.248, the holder of the 100-kilometre record, is still under repair after its crash. As we watched, a pontoon was seen coming down Southampton Water under tow, and on it rested S.1596, its new paint gleaming in the sun. Very smart indeed she looked. The new paint adopted gives, I was told, very satisfactory results on duralumin.

The two older seaplanes are known as the "A" type, and the two new ones as the "B" type. The older ones have, however, been modified and brought up to date, and, so far as I could discover, there is no practical difference between the two types. So far as a casual glance showed one, the chief difference between the machines now and two years ago was the balancing device on the top of each aileron and on each side of the rudder, which is intended to obviate any chance of flutter. Actually, the floats are considerably larger, and the wings are larger, too; in fact, all the dimensions have been increased, except those of the fuselage. Underneath the duralumin skin there is a very great difference. The Rolls Royce "R" engine is admitted to have given 1,900 horse-power in 1929. Now it is considerably more powerful, though by how much may not be stated. That means that it needs more fuel, more water, and more oil. The fuel is stored, as before, in the floats, the greater weight being in the starboard float, so as to resist the torque of

the engine. The fuel system has been largely redesigned. This by itself implied larger floats, while the increase of weight meant still larger floats, and also more wing area. Though there is no external sign of any radiator, the whole of the upper and lower surfaces of the wings, and the upper surfaces of the floats are acting as cooling surfaces for the water. The type of Fairey metal propeller is also new. In the last contest it was not possible for either engine to be run at the highest revolutions, partly because the tanks could not carry enough fuel and partly because there was not enough cooling surface. In the coming race no such restriction will be imposed. All these various modifications will, it is hoped, increase the speed of the machines. Still, the extra weight and the increased drag will militate against the extra engine power, and too much should not be expected.

As we approached Calshot, a Supermarine Napier S.5 was seen out in the Solent taking off. Stainforth was in the cockpit, and he took the seaplane off and flew round in a style which showed that two years at Uxbridge have not meant any loss of his former skill. Later, one of the pilots made a flight in the sole surviving Gloster Napier 4 biplane. This machine has done most excellent service as a practice machine. The event of the afternoon, however, was a flight by Flight Lieut. F. W. Long in S.1595. He had been practising at Felixstowe for the past year on the S.6 type, but this was the first occasion on which he had taken up one of the "B" machines. He handled it on the water and in the air in a style which showed that he is quite an adept with this type, and his banked turns were particularly masterly. If he is typical of the present High Speed Flight, we may evidently feel plenty of confidence so far as the human side of the race is concerned.

The greatest test in the coming contest will be the landing in the preliminary seaworthy trials. A machine must take off, fly round at about 50 metres, land, taxi for about two minutes, and then cross the starting line off Ryde pier. This landing will have to be made with enough petrol on board to carry the machine round the 350 kilometres of the speed course. In 1929 no pilot ever attempted to make a landing with full load of petrol. The risk of damage to the seaplane was too great, and in the normal course of the contest there was no need that he should make such a landing. This year the landing will have to be made with full load; and a full load now is considerably greater than it was in 1929. The pilots who achieve this feat successfully will be fine pilots. We have need of the best.

In this new High Speed Flight it was a great pleasure to greet two old friends, in Squadron-Leader Orlebar and Flight-Lieut. Stainforth. Of the new members, Flight-Lieuts. F. L. Long and J. N. Boothman, have been engaged at Felixstowe on high-speed flying for the past

year or so. I am not quite sure whether they have been entitled to call themselves a High Speed Flight all that time, but they like to do so. It was said to me that the High Speed Flight is the real thing; later on it degenerates into a Schneider team. Boothman is just 30 years old, but he has been busy for a long time. When he was only 16 he joined the French Red Cross as a volunteer motor driver, served in the Balkans, and won the Croix de Guerre. He joined the R.A.F. in 1921, with a short-service commission, became an instructor at the C.F.S., and later was given a permanent commission. Long, aged 32, also had a short experience of the war, as he was with No. 65 Squadron, in France, as a Second Lieutenant, shortly before the Armistice. He was out of the Service for two years, but in 1921 was given a short-service commission, which was later changed to a permanent commission.

It was a novelty to see a naval uniform in the High Speed Flight. Lieut. G. L. Brinton, R.N. (Flying Officer, R.A.F.), is the youngest member of the team. He is 26, but looks younger. He has not been with the High Speed Flight very long, and, so far, has not had very much practice on the racing seaplanes; but the fact that he

has been chosen is a testimony to his high reputation as a pilot.

Flying-Officer L. S. Snaith must be quite a remarkable man, for he started at the bottom and has risen to the honour of membership of the High Speed Flight through his own merits. He enlisted as a boy in the R.F.C. in 1917, and steadily worked his way up until he was taught to fly, and became a sergeant pilot and a flying instructor at No. 5 Flying Training School at Sealand. He was classed A1 as a flying instructor. He is also a notable athlete, and won the R.A.F. Half-mile Championship in 1927 in the record time of 2 min. $\frac{1}{4}$ sec. Perhaps another record now lies before him. He has also played Rugby football for the R.A.F. XV for three years. In 1927 he was granted a permanent commission.

Our team, therefore, seems to consist of a very useful lot of pilots, and, under the command of Orlebar, they will doubtless put in a fine lot of team work. Orlebar and Long were war pilots; Boothman was originally a short-service commission man; Stainforth hails from Sandhurst, Brinton from Dartmouth, and Snaith from the ranks. It is somewhat strange that in this category of origins Cranwell is not represented.

Airport News

CROYDON

THE outstanding event of the week was the arrival of Mr. J. Mollison from Australia, and we must offer him our congratulations on what was a great flight. His record is going to take some beating.

On Thursday morning early some uneasiness was felt owing to lack of news after his departure from Rome at midnight on Wednesday. The weather was filthy everywhere, and although he was expected somewhere between 8 and 9 a.m., we knew he could not make it without extreme difficulty. The morning wore on until midday, when news came through that he had landed safely at Paris, and had left again for Croydon. Then, again, he became overdue, and, about 3½ hours later, news came that he had landed at Pevensey Bay and was coming on at once. He arrived about 4 p.m. and was given an official welcome by Mr. Montague, and a crowd, consisting of mostly Press and aerodrome staff. He looked begrimed and tired out, but he had won through after a flight which he described as being far from enjoyable, and one can well believe it. Some amusement was caused by a boxing kangaroo that was brought to join in the welcome. The kangaroo wanted to have a few rounds with everyone at hand, including Mr. Mollison. However, we all say, "Well done, Mollison," it was a fine effort, and there ought to have been a bigger crowd to give him a cheer.

We had some distinguished personages at the aerodrome on Monday to see Princess Ingrid of Sweden off to Malmö by Royal Dutch Air Lines. The Duke of Connaught was one of those present. Royal Dutch Air Lines had a piece of misfortune at Rotterdam during the week when the 09.30 from Croydon collided with a wireless mast there. Mr. Pellens was the pilot, but, fortunately, no grave injury was done to anybody.

As is now well known, Imperial Airways also had some bad luck on Saturday when "Hannibal" crashed in Kent; again, fortunately, with no personal injuries to anybody. Mr. Dismore had no choice but to get down immediately. In landing, the tail hit a tree stump and was torn off, and very extensive damage was done to the machine, but, judging by the photographs, one imagines that the machine stood the jar marvellously, which speaks volumes for its construction. Sir Henry Birkin, who was aboard, stated that the vibration was terrific when the prop burst, and he thought the whole machine must fall to pieces in the air. On offering sympathy to the company for so bad a piece of luck, one must, at the same time, congratulate Messrs. Handley Page on the strength of this new type. One knows some aircraft, if involved in such an accident, would undoubtedly not have stood up to such a crash.

An unusual sight greeted us on Friday morning, and someone, somewhere, is bemoaning the loss of a pet. Perched up on the wireless aerial over the control tower was a green parrot, monarch of all he surveyed. He looked at the machines down below as if wondering what sort of birds they were. The control officer tried to entice him with some breakfast, but Brer Parrot was not having any, for he bade him farewell and flew off in a southeasterly direction. One of the Air Ministry clerks was waiting below hoping he would land, so he could collect his landing fee!

On Friday the Postmaster-General took a tea flight over London with Imperial Airways. One hears that he went up to count all the wireless aerials in London to see if anyone was dodging the column.

Tuesday and Wednesday were exceptionally busy days, owing to people coming back from the holidays after the week-end.

The traffic figures for the week were:—Passengers, 1,715; freight, 104 tons. P. B.

BARNARD Air Tours have arranged a visit to Heston on August 15. Their visit will coincide with the bringing into general use of the Heston veranda, which is the public enclosure part of Heston where refreshments may be obtained and such amusements as a dance floor are provided. Two enclosures will be laid out for the occasion, one at 2s. 4d. and one at 1s. 2d., while cars will be charged 1s. each. The display will start at noon and end about dusk.

Quite an extensive programme has been arranged, including a demonstration of two Autogiros; a visit by a H.P. 42, when the public will be allowed to walk through the cabin; high-speed aerobatics; probably on the Firefly; a number of parachute drops by Mr. John Trantum; a competition arranged by the "Daily Mail," with prizes in the form of free flights; and, of course, joyriding throughout the afternoon on the various machines which Barnard has been taking round the country, including the Spider and the Spartan three-seaters.

This display should give members of the general public a very good opportunity of seeing a modern sort of Aerodrome like Heston, and of gauging the interest which is being taken in private and club flying. The worst of these displays usually, is that the public are all too inclined to believe that flying consists entirely of aerobatic displays and that it has no really useful side. At Heston, however, care will be taken to point out to them that with a large and growing number of private owners flying is becoming just as much a means of everyday transport as is motoring.

THE BARROS STALL WARNING DEVICE

An Interesting Device which Warns the Pilot, in an Audible Manner when the Aircraft is Approaching the Stalling Point

THE solution of the problem of the inadvertent stall rests with an instrument which can, without fail, automatically detect a loss of flying speed and transmit to the pilot a warning which he cannot fail to understand, allowing him sufficient time to ease the stick forward and stabilise the machine.

The Barros Stall Warning Device provides an efficient means of detecting the approach of a stall and conveying a definite warning at a predetermined angle of incidence before the stalling point of the machine is reached.

The Warning Unit is let into the inter-cockpit communication tube. It comprises a casing containing a small bell movement, designed for the purpose, which operates on the diaphragm, mounted, as seen, on a drum, into which are fixed the tubular members, they in turn holding the speaking tube. The object of having the small drum is that, being directly connected to the speaking tube, inter-cockpit communication between pilot and passenger is in no way impaired.

It will be seen that all that is required of the pilot on entering his machine is to connect his head-phones to the

in a trice out of harm's way, without altering its adjustment.

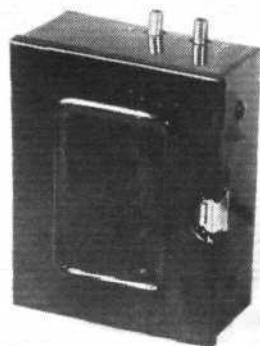
When the machine is on the ground, the normal tendency of the spring rod will be to be making contact, so an automatic cut-off is provided in the form of a small compression lever, controlled by two small vanes, as seen in the photograph, which, when the machine lands, forces the contacts apart.

Now, assume that the detector is adjusted to the required angle, and the machine accelerated over the ground. At a speed of about 35 m.p.h. the air pressure on the vane is sufficient to deflect it and hold it down at its lower limit. A slight increase in speed, and the automatic cut-off lifts, freeing the way for contact to be made at any time.

While the machine is flying normally, nothing happens. Directly the flying speed drops to a certain point, the angle of incidence of the supporting surfaces commence to increase in relation to the air flow, and it therefore follows that the surface resistance of the detector vane decreases for the same reason. Naturally, as the resistance de-



The warning device is illustrated on the left, attached to a typical interplane strut. At its foot is the buzzer which is connected in the cockpit telephone pipe. On the right is one of the buzzer drums open showing the belt-type mechanism, and on the extreme right is the small battery-box with plug-in terminals on the top. (FLIGHT Photos.)



speaking tube in the ordinary way, so that, when the detector completes an electric circuit, the warning will easily be heard by the pilot through his telephones.

The Detector

It is common knowledge to those acquainted with aerodynamics that the stalling speed of any given type of aircraft alters with the load, whereas the angle of incidence at which a machine stalls is always constant. The detector of this device can be said to operate on incidence, though it is actually an effective combination of that and speed. The photograph illustrates the detector fitted to an inter-wing strut. It consists of a small vane fixed to a spring-steel rod, which is mounted in a tube and adjusted to have an upward tension. The fore part of the tube is insulated, and has a wedge-shaped contact stud. This shape is the means by which the contacts are kept clean, owing to the rubbing movement it induces.

In order to obviate damage to the detector vane when housing the machine in a confined space, a quick release is provided, which enables the pilot to fold the detector

creases on the vane, the rod rises, gradually or swiftly, according to the rate the aircraft is losing way, until the two contacts touch; the electrical circuit is completed, and the warning is heard by the pilot, whose wandering attention is drawn back to the machine in ample time to take the necessary precautions.

Any source of electric current of low voltage may be used, but provided with the set is a container to take a battery known as the Ever Ready No. 1215, which, with normal use, lasts about 12 months.

The following features of the Barros Stall Warning Device should be carefully noted:—It operates before the stalling point is reached. It does not interfere with the pilot's controls. It does not require observation. No structural alteration to the machine is necessary when fitting. It is designed to fit any type of machine. It is simple to fit and adjust.

Mr. J. Barros, Room 17, 8, Princes Street, London, E.C.2, is the designer, and all inquiries should be addressed to him, mentioning FLIGHT.



Private Flying & Club News

BROOKLANDS AERO CLUB.—From August 3 Mr. J. Cattley will be the Secretary of the Brooklands Aero Club as Mr. C. S. Burney has retired.

EASTERN COUNTIES AEROPLANE CLUB would like to thank all visiting pilots and others who helped to make their display on August 1 such a success, and they further extend a hearty welcome to anyone who visits them in the future.

THE HERTS & ESSEX AEROPLANE CLUB.—Since June 5 the Herts and Essex Aeroplane Club has gained six "A" licences, namely those of Messrs J. G. Ormston, J. A. MacDonald, F. E. Darlow, G. E. Lloyd, C. H. Dowdeswill and G. Greenwood. Four members, Messrs. T. C. Saunders, J. G. Ormston, C. R. Schultz and J. Stack, have become private owners with their own machines. The performance of Mr. Ormston in the King's Cup race was really astonishing when one realises that he only took his ticket in June last, had never been over the course, in fact had done very little cross-country flying at all, had a total flying time of only 40 hr. to his credit. Yet he got round quite successfully, finishing 18th in a field of 21, with the extraordinarily creditable average of 92.3 m.p.h. On Monday, July 27, seven members formed the club's first foreign outing. They flew in three Moths and a Widgeon with F/O. W. R. Bannister, the Club's Instructor, as leader.

IRISH AERO CLUB SUBSIDY.—The vote of £1,000 for the Irish Aero Club has now been passed by the Free State Dail (Parliament). During the course of the debate the Minister for Industry and Commerce said that it was not his intention to ask the House for any other moneys for Civil Aviation, and that he had never received any really practicable scheme for the establishment of a Dublin-London air service. It has not yet been decided how the subsidy shall be paid to the Club, but it is understood that it will not be in the form of a capitation grant of so much for each pilot trained; it is believed that the Club will inform the Department of Industry and Commerce of the equipment they intend purchasing, and, on the approval of the Minister, the money will be paid over.

HANWORTH CLUB.—Visit of *Graf Zeppelin* to Hanworth: The postponed visit of the *Graf Zeppelin* to Hanworth will take place on Tuesday, August 18, at 7 p.m. The ship will leave Hanworth at or about 8.30 p.m., and will return on Wednesday at about 7 p.m.

Passenger reservations may be booked for the 24-hour cruise at £30.

Members of National Flying Services' Clubs attending must produce membership cards at the entrance gates.

Dinner on the 18th and 19th can only be guaranteed to those for whom reservation has been received by noon on Monday, the 17th inst.

PHILLIPS & POWIS SCHOOL OF FLYING at Reading have, in spite of bad weather, managed to fly some 490 hr. during the last two months. Many "A" licences have been obtained, amongst them by a native of Copenhagen, Herr Hensan, and also by representatives from India and Egypt. The club bedrooms are now all full and the new facilities, particularly the swimming pool, are greatly appreciated.

During last week five machines have been sold, one, a Spartan, which was bought by Miss Pauline Gower, who recently obtained her "B" licence, and another, a Gipsy Moth, bought

by Mr. L. E. de Almasy and Count Zich. This machine will be used for exploration in the Sahara. Mr. de Almasy recently discovered the old slave route from the south and six of the seven oases on this route. He is now going to use the Moth as a means to find the seventh. His camp will be in a central position and flights will be made from this to all points of the compass.

THE SCARBOROUGH AIR PAGEANT AND RALLY.—

The Scarborough Aero Club have arranged their second pageant and rally to take place on Saturday next, August 15. Lunch and other refreshments will be provided by the club and all visitors made welcome.

The arrival competition will take a novel form, as instead of a fixed zero hour, which makes possible a number of machines having to cross the line at the same time, there will be an arrival time spread over a period from 12.15 to 12.45 p.m., during which there will be three sealed times, the winners thus being nearest to these times. One of these prizes will be for the first lady pilot, and in the event of there being no lady pilot arriving, then this prize will be awarded to the competitor coming the greatest distance away.

On Sunday afternoon a Ladies' Day is being held, when all lady pilots will be most welcome. The Aerodrome, which is the old Scarborough racecourse, is situated about two miles west of the town.

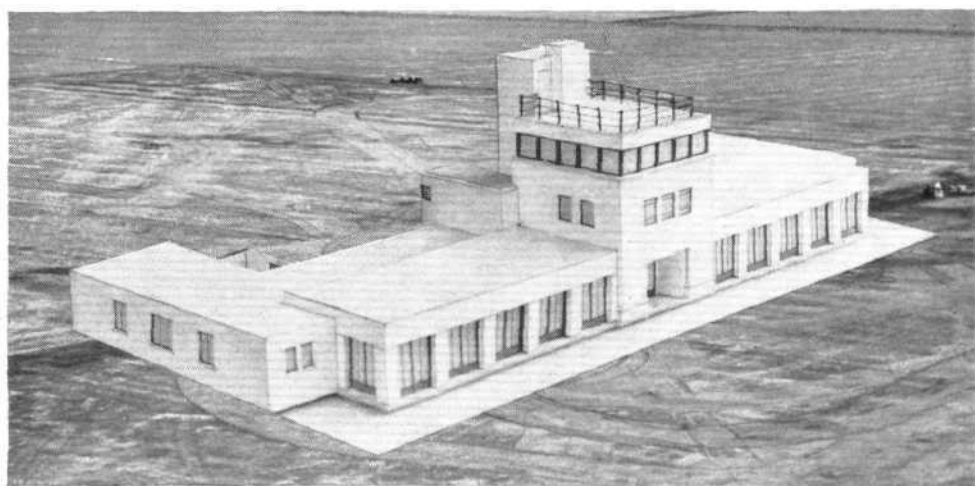
CINQUE PORTS FLYING CLUB.—Flying time for the week ending August 2 reached 26 hr. 40 min., a very good figure, having regard to the abnormally bad weather. Several new pupils commenced instruction and one or two old members, who have not been flying lately, returned to the fold.

Mr. Morris, of Cranbrook, who, it will be remembered won the Tatler Flying Scholarship, successfully passed his "A" Licence Tests on Wednesday, July 29.

A remarkably good performance was put up by two of the Club's lady private owners, Miss Aitken and Miss Giles, who returned on Thursday, July 30, from a fortnight's flying tour of France, covering a very big mileage during the period. They expressed themselves very pleased with the courtesy extended to them on all the friendly aerodromes on which they landed, and were particularly impressed by the French Meteorological Service.

It is interesting to note, according to official figures just to hand, that in 1929 76 people were killed by falling out of bed, whereas only 47 were killed in flying accidents. Motor accidents accounted for no less than 1,660 deaths.

The Club was well represented at the Rallye International du Deauville, having no fewer than six members present.



DEVELOPMENT: This photograph is from a model of the new Club House which is now being completed at Brooklands. The Tower is 35 ft. high.

Gliding

THE SECOND BRITISH GLIDING COMPETITION.—

The British Gliding Association is organising an International Gliding Competition to take place on Saturday, October 3, and Sunday, October 4, at Balsdean, Sussex (provisionally). The competition will be called the "2nd British Gliding Competition, 1931," is under the Regulations of the F.A.I., and, where applicable, the Competition Rules of the British Gliding Association. The competition will be under the distinguished patronage of the International Commission for the Study of Motorless Flight.

The competition is open to motorless aircraft which fulfil the conditions specified. Entries shall be made in accordance with Rules 32 to 36 of the "Open Competition Rules of the British Gliding Association" (see B.G.A. Handbook, price 3s., post free).

Entry forms may be obtained from the Secretary, British Gliding Association, 44A, Dover Street, London, W.1. All competing aircraft must carry a Certificate of Airworthiness granted by the British Gliding Association. Foreign machines must carry a Certificate of Airworthiness validated by the British Gliding Association (fee £1 1s.), in accordance with the Regulations for Airworthiness.

Before taking part in the competition, all aircraft must be presented to the B.G.A. Technical Committee for admission test, and the following documents produced:—

- (1) Certificate of Airworthiness.
- (2) Ground Engineer's Certificate.
- (3) Details of the machine, giving a brief history of its work, i.e., number of certificates obtained on it, number of launches, bad crashes, etc.
- (4) A good unmounted photograph of the machine.

The competition shall be divided into the following classifications:—

- A.—Primary Training Machines.
- B.—Secondary Machines.
- C.—Sailplanes.

EVENTS OPEN TO "A" MACHINES.—TO BE HAND LAUNCHED.—Rig and Fly Contest; Spot Landing Competition; Distance Flight; Duration Flight; Aggregate Flying Contest; Distance Flight, open to British Women Pilots only.

CONTEST OPEN TO "B" MACHINES.—Rig and Fly Contest; Duration Flight, with return to within 150 yards of the point of departure (machines must be hand launched); Distance Flight, with return to within 150 yards of the point of departure (the pilot must indicate his goal and fly over the designated spot; pilots must notify their goal in advance, so that officials can be posted there; machines must be hand launched); Altitude above starting point.

CONTESTS OPEN TO "C" MACHINES ONLY.—Rig and Fly Contest; Fastest Flight on a straight course of not less than 1 mile in length; Distance Flight, with return to within 150 yards of point of departure (the pilot must indicate his goal and fly over the designated spot); Altitude above starting point.

CONTEST OPEN TO ALL TYPES OF MACHINES.—First machine in the air after the meeting is declared open on Saturday (the winner must remain airborne at least 30 sec.); First machine in the air after the meeting is declared open on Sunday (the winner must remain airborne at least 30 sec.).

CONTESTS OPEN TO "B" AND "C" MACHINES ONLY.—Distance Flight, across country; Duration Flight, with return to within 150 yards of point of departure, for passenger-carrying machines carrying a passenger; Figure-of-Eight Contest round two pylons; Out and Home Contest, for a passenger-carrying machine carrying a passenger.

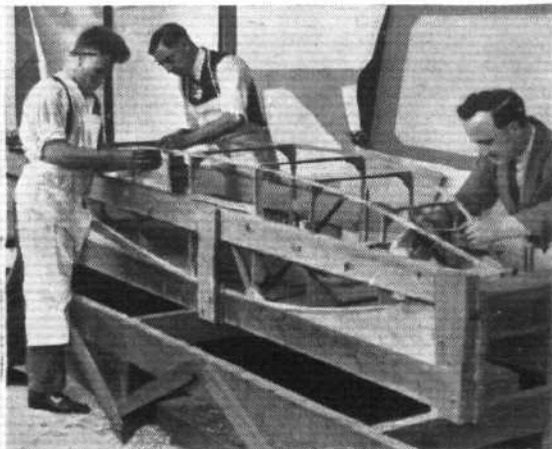
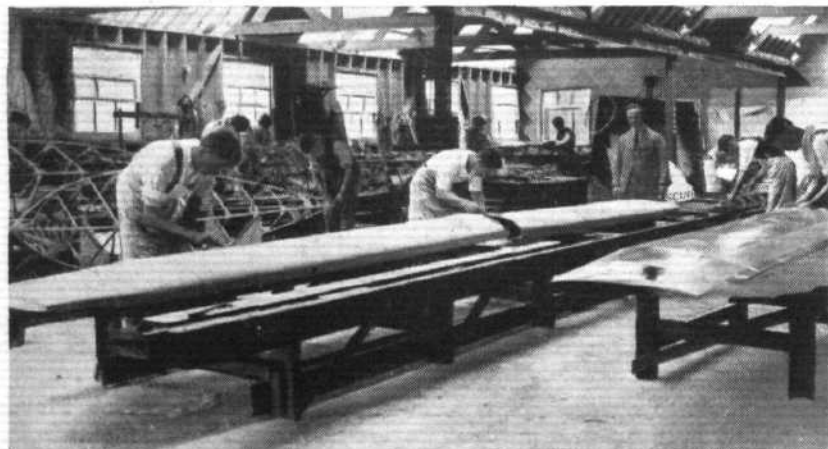
Only British entries accepted for and British pilots allowed to compete in the events limited to "A" and "B" classes of machines, and in event No. 19. All pilots must hold a Glider Pilot's Certificate.

All pilots competing in "B" class machines must hold a "B" Glider Pilot's Certificate, and all pilots competing in "C" class machines must hold "C" Glider Pilot's Certificates.

NEW GLIDING RECORD.—F./O. Mole, flying his "Professor" of the London Gliding Club at Ditchling Beacon, the flying ground of the South Down Sailing Club, at their gliding meeting on Sunday, August 2, stayed in the air 6 hr. 10 min. 38 sec., landing only owing to darkness. This constitutes a record, beating the previous best of 4 hr. 15 min.



THE SCUD: That excellent little high efficiency glider, the Scud, designed by Mr. Baynes, is now in production in the works of E. D. Abbott, Ltd., at Farnham, Surrey. The photographs show the fuselage assembly, and the wing shop, while above there are views of the trailer and the Scud in flight.



Air Transport

Air Signs on Gas Holders

WHEN the memorandum on standard air signs, prepared by the Automobile Association, was issued last June by the Civil Aviation Section of the London Chamber of Commerce with a view to the adoption of the scheme throughout the country, it was suggested that it might be convenient in certain localities to have air signs on gas containers, although such signs were to be regarded as additional to a national scheme of standard air signs situated to the south-west of a town. A statement issued by the section now announces that, "as a result of the section's action, air signs are to be painted on the tops of the gas holders at the Kingston-upon-Thames works of the Wandsworth and District Gas Company as soon as possible. It is understood that arrangements have also been made by the company for appropriate signs to be painted on a gas holder at each of their other stations—namely, Epsom, Sutton, Worcester Park, Mitcham, and Wandsworth.

It will be remembered that such action has already been taken in other parts of the country, particularly in Leicestershire.

State Air Mail in India

THE General Purposes Retrenchment Sub-Committee deliberated with departmental officials for several hours on August 11 over the proposals for establishing a State air service to carry air mails in the first instance between Karachi and Calcutta. The need for retrenchment makes the realisation of the whole scheme in the New Year, as planned, improbable.

The Civil Aviation Department, co-operating with the Retrenchment Sub-Committee, has, in the past month, reviewed eight alternative schemes intended both to avert the collapse of the air mail scheme and assist retrenchment. The discussions were private, but they are understood to have been marked by a spirit of co-operation. No conclusion was reached.

Mails for South America

A GERMAN Dornier "Wal" flying-boat left Southampton on August 11 for Cadiz, where it will inaugurate a service between South America and Europe to accelerate the mail delivery.



The Northrop Alpha is an all-metal aircraft carrying 1,822 lb. useful load. Its cruising speed is 140 m.p.h. with a radius of 700 miles and 116 gall. of fuel. The engine is a Pratt and Whitney Wasp of 420 h.p. With a wing area of 295 sq. ft. the wing loading is 15.25 lb./h.p. and the power loading 10.7 lb./h.p. It is probably one of the most efficient American transport aircraft and has accommodation for 7 passengers.

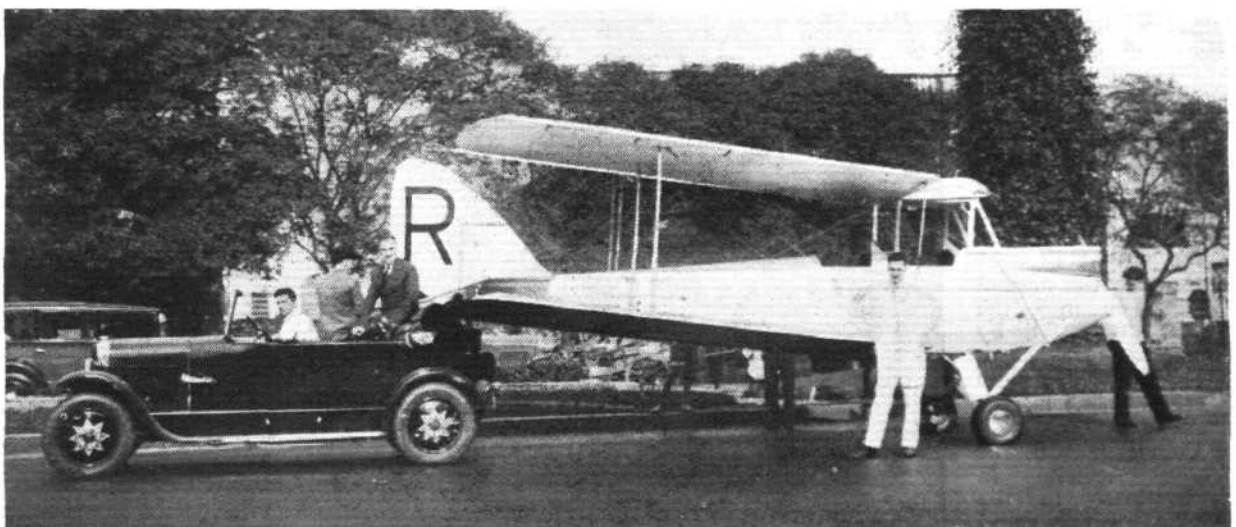
Two flying-boats will carry mails from Cadiz to Las Palmas, in the Canary Islands, where liners will pick up the mails for South America. Flying-boats will also take mails dropped by liners at the island of Fernando Noronha on to Rio de Janeiro.

English mails will be able to make use of the quickened service by being sent by air to Germany and then transferred to machines which will do the land journeys of the new service. The service will be run by the German Luft Hansa Company.

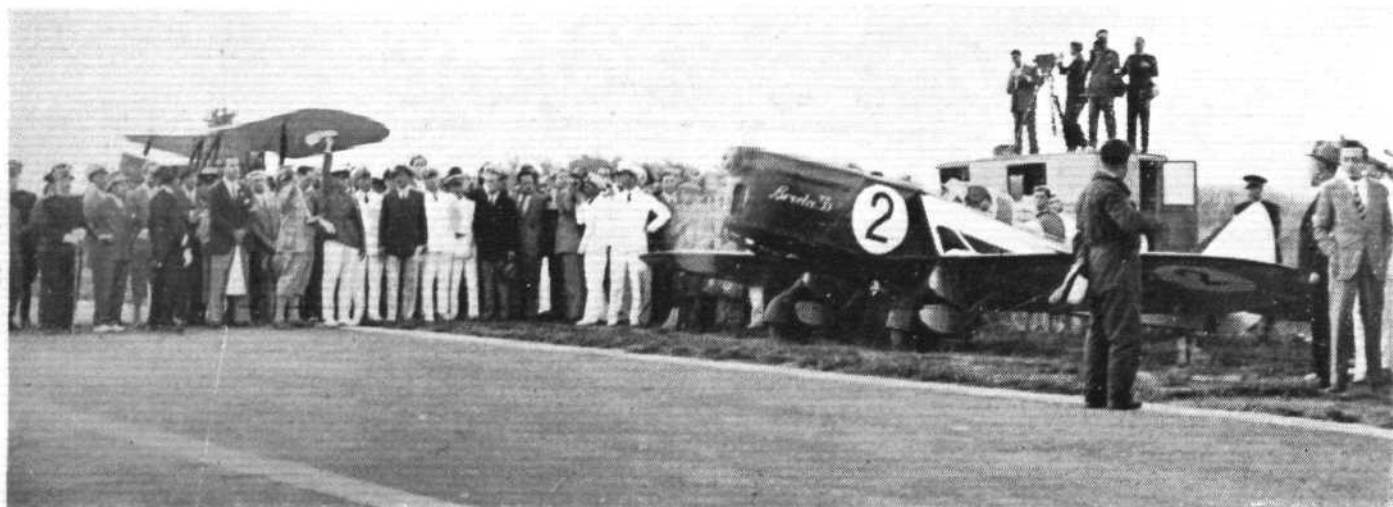
German Students' Fares by Air

In order to interest Young Germany in aviation the Deutsche Luft Hansa has extended facilities to students who are not in a financial position to pay the ordinary costs of air travel by which a trip in an aeroplane will cost them no more than a third-class railway fare for the same distance.

Students will have the option of places which remain unsold after ordinary air passengers have been accommodated. All the student has to do is to obtain a form at one of the Luft Hansa offices or at his school or university and fill it in.



SOLD AT THE BUENOS AIRES EXHIBITION: A Gipsy Moth being towed to the aerodrome, from which it was flown to the Moron aerodrome by the de Havilland representative, Mr. Ballantyne (seen in the back of car), there to be handed over to the purchaser.



IL DUCE AS A STARTER: Signor Mussolini dropping his flag and starting Meleri off.

CIRCUIT OF ITALY

FROM previous references in FLIGHT to the Circuit of Italy, our readers will know that in the general touring aeroplane class, Breda machines secured first, second, and third places, while in the heavier class, very kindly established by the Italian Aero Club to enable the De Havilland "Puss Moths" to compete, Captain Hubert Broad secured first place on a "Puss Moth" with Gipsy III engine. Readers of FLIGHT will also be aware that the Italian competition was divided into two parts: Preliminary technical and performance tests, and a flight over a circuit covering the whole of Italy.

The Technical Tests

The preliminary technical tests took place at the Littorio aerodrome at Rome from July 9 to July 15. These tests included a climbing test, a take-off test, and an alighting test, in which points were awarded. A system of awards was also used for classifying the machines according to certain practical qualities, comfort, parachutes, etc., while such features as weight, cylinder capacity and wing loading were taken into account and awards of points made. The subsequent Circuit of Italy was a handicap race in which the handicap allowances were based upon the number of points obtained by competitors in the preliminary technical tests.

The accompanying table sets out the number of points scored in the various technical tests by the different competitors, and shows the classification which determined the order of starting on the Circuit of Italy. The table, it will be observed, is divided into two sections, according to whether the weight brought the machine into the normal touring class or into the heavier class designated by the Italians "Categoria Gran Turismo." The latter class is that established, largely as a result of the good offices of Colonel Bitossi, the Italian Air Attaché in London, to bring in the "Puss Moths," which could not, except by stripping them, be brought within the weight limit imposed in the general class.

From the table it will be seen that, of the 33 machines in the general class, five were German, one British, and the rest Italian. In the "Gran Turismo" class all four machines were British. The table also discloses the fact that, of the 37 machines taking part, 11 were fitted with British engines, five with German, one with American, and the rest with Italian engines.

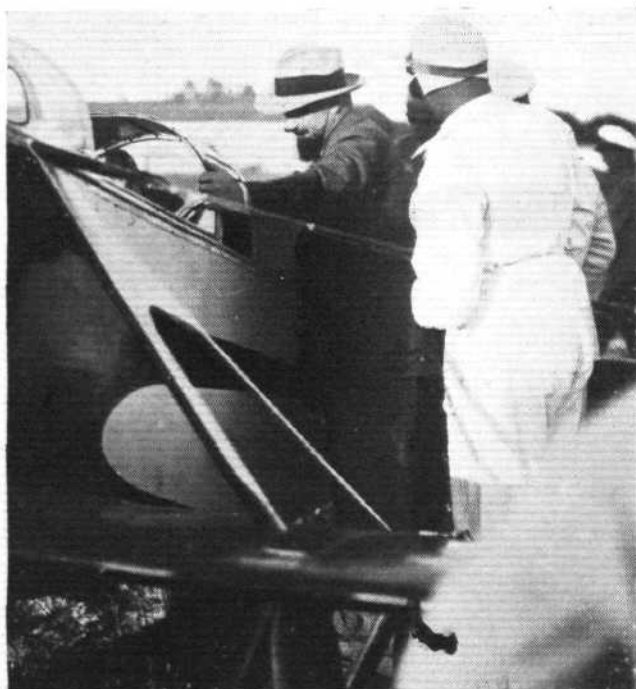
In the results of the technical tests, two Breda 33's with De Havilland Gipsy III engines are seen to occupy first and second place, with a Caproni Ca 100 (Alfa-Romeo engine) third in the general class, while in the heavier class a British and an Italian pilot were first and second on "Puss Moths" (Gipsy III), with Broad, also on a "Puss Moth," third.

The Circuit of Italy

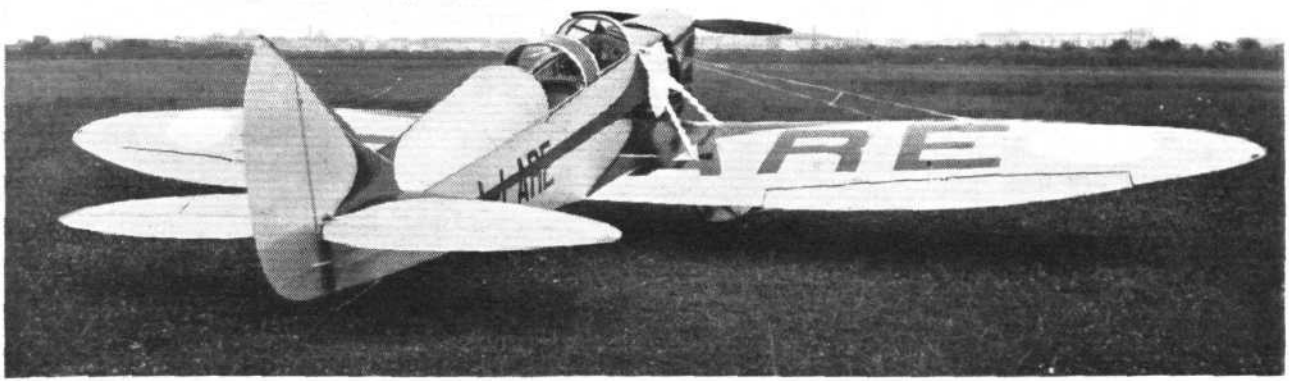
Following the technical tests, the competing machines were required to cover a very criss-cross circuit of Italy, the actual route followed being shown in our small sketch map. The start took place on the Littorio aerodrome, Rome, on July 17, the order of starting being decided in accordance with the points gained in the technical tests, and the relative starting times being shown in the second column of our table. The first man to get away was Colombo on a Breda 33 (Gipsy III), with Meleri, on a similar machine, starting at the same time, they having scored the same number of points in the technical tests.

The first day's stage was from Rome to Palermo, in Sicily, with six compulsory landings and six turning points on the way. The distance was one of 700 miles, and the first to arrive was Colombo, who was followed by Meleri as second. By the time the Palermo control closed at 8 p.m., 21 machines had arrived, 17 of the normal class and all the four "Puss Moths" of the heavier class. Colombo had covered the first stage at an average speed of 118 m.p.h. Many competitors fell by the wayside during this first stage, the reasons being varied. Mr. John Carberry had to retire early owing to a broken pipe.

A worse fate befell some



MINISTERIAL INTEREST: General Balbo, Italy's Air Minister, examining one of the "Breda 33" machines.



THE WINNER: Colombo's "Breda 33" (Gipsy III), with cockpits open. Transparent panels turn the machine into a cabin monoplane.

of the Italian competitors. When dropping the prescribed message at the aerodrome of Naples, Pallavicini stalled his machine at a low height and crashed, he being injured and his engineer, Alessio Donati (a brother of the famous Italian pilot), being killed. Lieut. Carera was caught in a storm off the coast of Sicily, and fell into the sea, he and his engineer, Mario Santorre, being drowned.

The second stage of the Circuit of Italy was from Palermo to Rimini, a distance of 780 miles, and there were

10 compulsory landings, to be made at controls, and seven turning points to be passed in flight. This stage also was won by Colombo, who was followed 12 minutes later by Meleri, with Poss, on a Klemm, third to arrive, 23 minutes after Meleri. Lusser, Mai, Siebel, and Folz followed, in the order given, and the race was beginning to resolve itself into a struggle between the Breda machines and the Klemms.

In the heavier class, Nathan beat Broad by a few

CIRCUIT OF ITALY

Results of Preliminary Technical Tests, General Class

Place	Starting Time	Pilot	Aircraft	Engine	Points in Different Tests							
					Altitude	Practical Qualities	Take-off	Landing	Weight	Cylinder Capacity	Wing Loading	Total
	h. m.											
1	5 00	COLOMBO ..	Breda 33 ..	Gipsy III ..	10	71	3	7	5	75	75	246
2	5 00	MELERI ..	Breda 33 ..	Gipsy III ..	10	71	1	9	5	75	75	246
3	5 02	VELARDI ..	Ca 100 ..	Alfa Romeo ..	8	60	0	11	1	85	79	244
4	5 05	LUSSER ..	Klemm L. 26..	Argus As 8 ..	7	60	7	15	5	67	80	241
5	5 12	SIEBEL ..	Klemm L. 26..	Argus As 8 ..	4	63	7	12	4	67	80	237
6	5 14	DE ANGELI ..	Breda 15 S. ..	Gipsy III ..	9	57	1	9	2	75	79	232
7	5 14	MAI ..	Klemm L. 26..	Argus As 8 ..	5	59	6	12	4	67	80	233
8	5 15	POSS ..	Kelmm L. 25 E	Argus As 8 ..	9	60	6	11	8	67	70	231
9	5 21	MENCARELLI ..	Ca 100 ..	Gipsy III ..	0	53	3	14	1	75	79	225
10	5 22	FOLZ ..	Klemm L. 25 ..	Argus As 8 ..	6	61	4	7	8	67	71	224
11	5 24	SAVINI..	Ca 100 ..	Gipsy III ..	4	53	3	7	1	75	79	222
12	5 28	DIAZ ..	Ca 100 ..	Hermes ..	0	52	1	9	1	75	80	218
13	5 36	GOVI ..	Ca 100 ..	Gipsy III ..	0	53	2	10	1	75	79	210
14	5 46	SUSTER ..	A. S. 1 ..	Fiat A. 50 L.	0	50	0	10	1	62	77	200
15	5 46	FUMAGALLI ..	Ro 5 Bis ..	Fiat A. 50 S.	0	52	2	7	1	62	76	200
16	5 48	CALDERONI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	10	2	62	78	198
17	5 50	ROTA ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	9	2	62	77	196
18	5 51	STABILE ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	6	3	62	78	195
19	5 51	VIAZZO ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	8	2	62	77	195
20	5 52	BROGLIO ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	5	3	62	77	194
21	5 55	ORLANDI ..	A. S. 2 ..	Fiat A. 50 S.	0	49	0	6	1	62	73	191
22	5 56	LOCATELLI ..	A. S. 2 ..	Fiat A. 50 S.	0	49	0	7	0	62	72	190
23	5 56	ROLANDO ..	A. S. 2 ..	Fiat A. 50 S.	0	49	0	7	0	62	72	190
24	5 56	DUBINI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	0	4	62	78	190
25	5 56	BOTTOLI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	2	2	62	78	190
26	5 57	RAVAZZO ..	A. S. 2 ..	Fiat A. 50 S.	0	46	0	0	3	62	78	189
27	5 57	CARERA ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	0	3	62	78	189
28	5 57	ALBERTA ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	0	3	62	78	189
29	5 57	MATTIOLI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	0	3	62	78	189
30	5 57	TACCARI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	2	2	62	77	189
31	5 58	PALLAVICINI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	1	0	2	62	77	188
32	6 00	SPALLANZANI ..	A. S. 1 ..	Fiat A. 50 ..	0	46	0	0	1	62	77	186
33	6 07	CARBERRY ..	Monocoupe ..	Warner ..	0	47	3	6	3	58	62	179

"Gran Turismo" Class

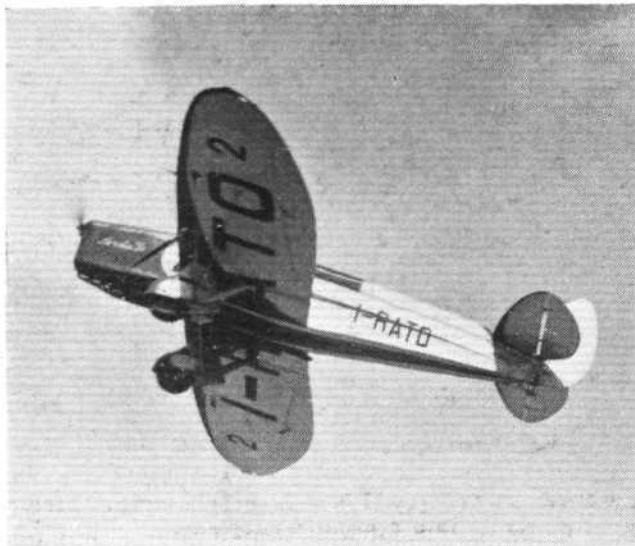
34	7 00	NATHAN	.. Puss Moth	.. Gipsy III	10	51	0	10	1	75	79	226
35	7 03	FOLONARI	.. Puss Moth	.. Gipsy III	7	51	0	11	0	75	79	223
36	7 04	BROAD	.. Puss Moth	.. Gipsy III	7	51	0	10	0	75	79	222
37	7 11	FRETZ	.. Puss Moth	.. Gipsy III	5	47	0	7	2	75	79	215

seconds. Colombo's time for the first stage was 6 h. 17 m. 10 s., and for the second 6 h. 59 m. 27 s., or a total of 13 h. 13 m. 37 s. for the two stages. In the heavier class, Nathan's time for two stages was 14 h. 22 m. 44 s., and Broad's 14 h. 24 m. 57 s.

The third stage was from Rimini to Venice, a distance of 750 miles, with 11 controls and four turning points. Again, on this stage Colombo gained first place, with a flying time of 6 h. 49 m., or an average speed of 110 m.p.h. Meleri was second, with a speed of 193 m.p.h. The total flying times for the first three stages were: Colombo, 20 h. 3 m. 25 s.; Meleri, 21 h. 9 m. 33 s.; Poss, 22 h. 12 m. 21 s. In the heavier class, the total times were: Nathan, 21 h. 50 m. 21 s.; Broad, 21 h. 52 m. 30 s.; Fretz, 23 h. 15 m. 20 s.; and Folonari, 24 h. 55 m. 44 s.

The fourth stage, Venice to Milan, was one of 700 miles, with nine controls and three turning points. No great changes in the placing of competitors took place during this stage, and Colombo maintained his lead.

The fifth stage was from Milan to Turin, and was of 338 miles only, with three controls and two turning points. Fifteen machines of the general class completed this stage, and all the four "Puss Moths" of the heavier class. At the end of the stage, Colombo was leading with a total flying time of 29 h. 26 m. 12 s.; Meleri was second, with a flying time of 33 h. 16 m. 24 s.; De Angeli was third, his time being 33 h. 18 m. 4 s. In the heavier



ON THE WAY: One of the "Breda 33's" (Gipsy III) in flight.

class, Broad had pulled up to first place, with a flying time of 31 h. 24 m. 21 s.

The sixth and last stage was from Turin to Rome, and was one of 640 miles, with 10 controls and two turning points. In spite of the fact that his throttle control broke and he spent some 15 minutes repairing it, Colombo was again first, with a flying time for the stage of 6 h. 9 m. 54 s. This gave Colombo a total flying time for the whole course of 35 hours, equivalent to an average speed over the whole Circuit of Italy of 110 m.p.h. Meleri came second, with a total flying time of 39 h. 47 m., and De Angeli third, with 41 h. 6 m. Lusser, on a Klemm, was fourth in the general class, with 41 h. 38 m. In the heavier class, Broad was first, followed by the other

three "Puss Moths," all of which finished the course.

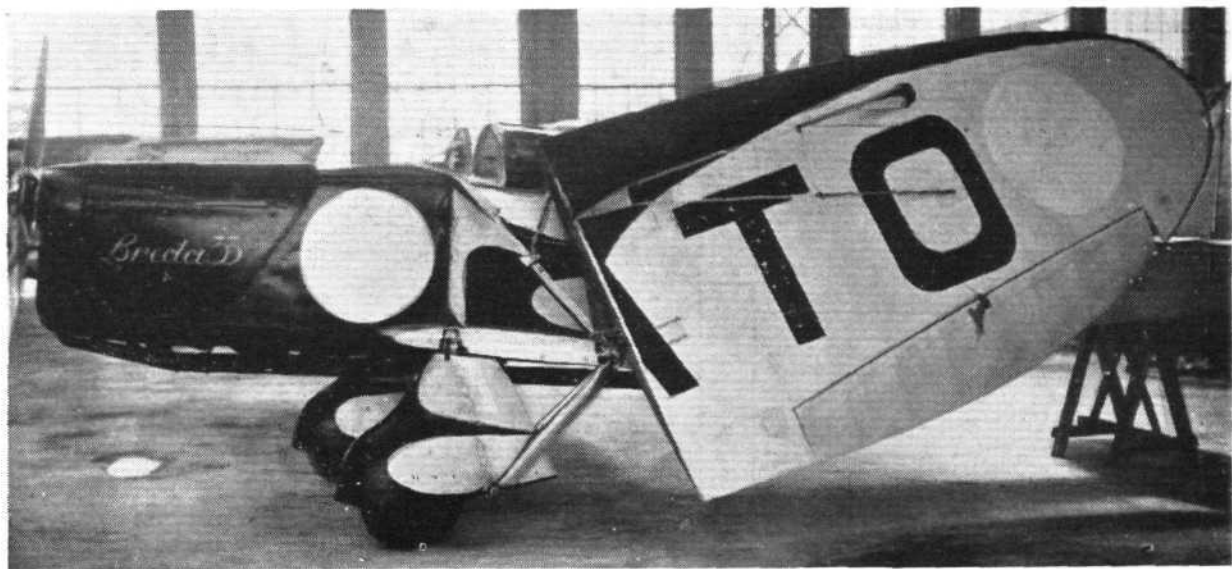
The Winning Machine

The Breda 33 was designed as a high-speed touring machine by the firm's chief designer, Signor Cesare Pallavicini, not to be confused with the pilot who flew in the competition. The machine is a low-wing semi-cantilever monoplane of composite construction, with welded molybdenum steel fuselage, wing centre-section of steel, and wing proper of wood construction.

The Breda 33 is a two-seater, with pilot in front. Dual controls are provided, the rear set of controls being detachable. The machine can be flown either as an open or as a cabin machine, flexible transparent panels of



A BIRD'S EYE VIEW OF THE "BIRDMEN": An unusual snap from the Circuit of Italy. Reading anti-clockwise, Herr Von Hoepfner (German Aero Club) is at "11 o'clock," and then follow Signor Pallavicini, designer of the "Breda," Signor Meleri, second in the contest, Mr. John Carberry, Captain Hubert Broad, first in the "Gran Turismo" class, and Signor Colombo, winner of the Circuit of Italy in the general class.



AT REST: One of the "Breda 33's" with wings (what little there is of them) folded.

greenish tint (intended to protect against strong sunlight) sliding in a fixed framework in the deck fairing. These panels can be locked in any intermediate position, so that any desired degree of ventilation can be obtained. A very complete set of instruments is provided, and a second set can be provided for the back cockpit if desired. Gyro turning indicator and inclinometers are fitted, so that the machine can be used for "instrument flying." The machine is furthermore equipped for night flying, with all the necessary navigation lights, cabin lights, and lights for

illuminating the well arranged instrument board. Behind the passenger is a large luggage space, accessible from both sides of the machine when on the ground, and from the cabin during flight. If the machine is to be used for flights entailing exceptionally long stages, the luggage space can be used for housing an extra petrol tank of 13 gallons capacity. A split undercarriage is fitted, with oleo-elastic shock absorbers. The travel is 9 in., and low-pressure tyres are used. Wheel brakes are fitted.

Main Data

Dimensions

Length over all	... 6,80 m.
	(22 ft. 3 in.).
Wing span	... 9,40 m.
	(30 ft. 10 in.).
Total height	... 2,00 m.
	(6 ft. 7 in.).
Wing area	... 15 m. ²
	(161.5 sq. ft.).

Weights

Tare weight	... 430 kg. (946 lb.).
Useful load (standard)	300 kg. (660 lb.).
Useful load (auxiliary)	400 kg. (880 lb.).
Gross weight (standard)	730 kg. (1,606 lb.).
Gross weight (auxiliary)	830 kg. (1,826 lb.).
Wing loading (standard)	48,7 kg./m. ²
	(9.5 lb./sq. ft.).
Wing loading (auxiliary)	55 kg./m. ²
	(11.3 lb./sq. ft.).
Power loading (standard)	6,1 kg./h.p.
	(13.4 lb./h.p.).
Power loading (auxiliary)	6,9 kg./h.p.
	(15.2 lb./h.p.).

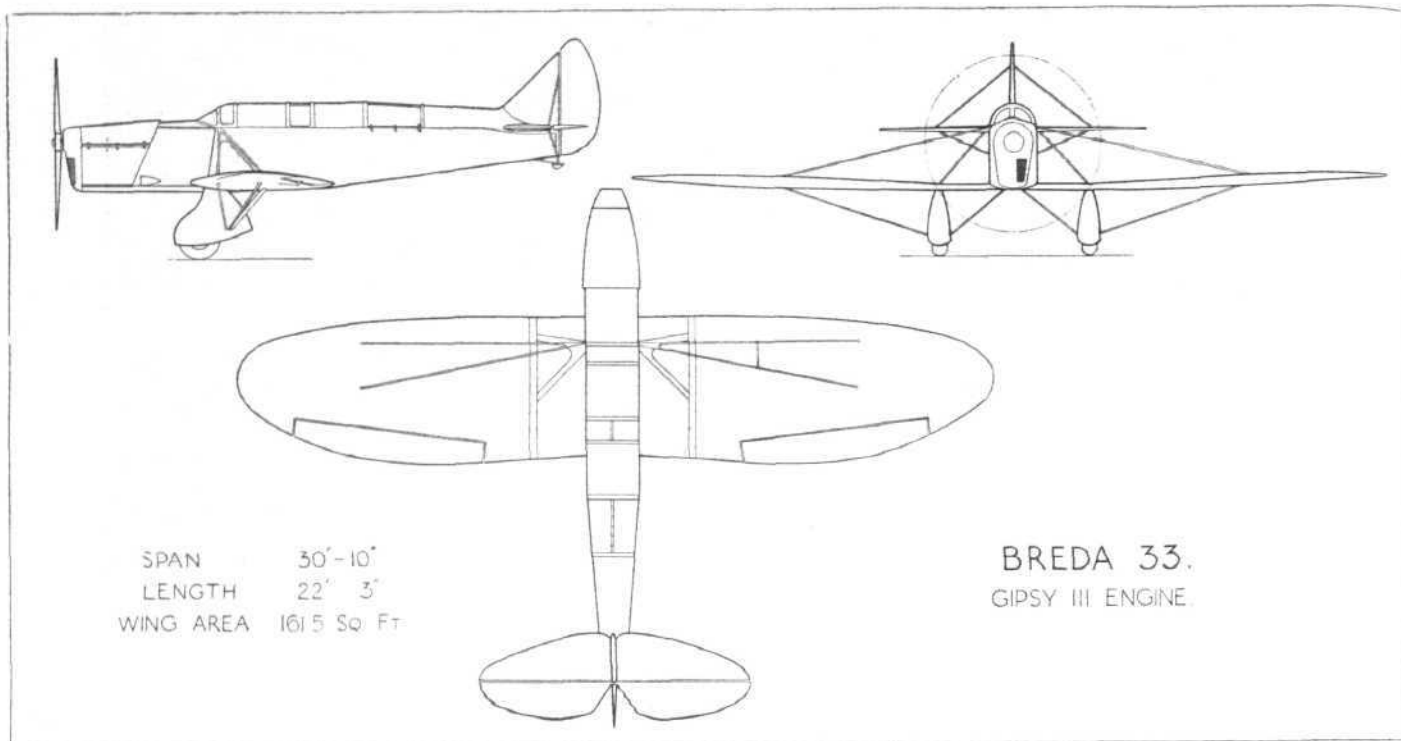
(The "standard" weight, etc., refers to the machine with its normal tanks filled. For long flights extra tanks can be fitted, which brings the weight up to the "auxiliary figures.")

Performance

Maximum speed	... 230 km./h.
	(143 m.p.h.).
Cruising speed	... 200 km./h.
	(124 m.p.h.).
Minimum speed	... 85 km./h.
	(53 m.p.h.).
Normal range	... 1 200 km.
	(745 miles).
Auxiliary range	... 1 800 km.
	(1,120 miles).
Climb to 4 000 m. (13,000 ft.)	in 15 min.
Ceiling	... 7 000 m.
	(23,000 ft.).
Take-off in	... 90 m. (100 yds.).
Landing run after clearing obstacle	5 m.
	(16 ft.) high, 130 m. (145 yds.).



THE CIRCUIT OF ITALY: Sketch map of the course.



THE BREDA 33: General Arrangement Drawings.

Britain's Share

Great Britain has cause to be proud of its part in the great Italian competition. Not only did all the four De Havilland "Puss Moth" machines complete the entire course, but the British engines fitted in the various machines acquitted themselves extremely well in this very severe test of reliability, and have by their performance further enhanced the reputation of British light planes and light plane engines. It may be mentioned that, out of the first eight machines to finish the Circuit of Italy, seven were fitted with Gipsy III engines.

In this connection it is of interest to quote the following extract from a letter received by the De Havilland Company from Mr. Maurice Nathan, who is a director of Fiat Motors, Ltd., and who competed in the Circuit of Italy in his own Puss Moth.

"I now want to convey to you how grateful I am for your having sent your engineer to carry out such alterations, as it would have been impossible for me to carry out without the help of your expert. I realize the expense you have incurred and I must say that I fully appreciate the liberality of your

service policy, which, however, I feel confident will in due course bring you also the satisfactory financial results which I consider you deserve. Having been for many years connected with the motor business I think I can value for what it is worth the goodwill of a Trade Mark, and I am sure that at present, in consideration of your policy, no name stands out so prominently in the aircraft industry as your own.

"I now wish to tell you how satisfied I have been with the behaviour of my Puss Moth during the Italian Tour. I did not experience one single trouble bar the loss of the skid shoe on the aerodrome of arrival in Rome, after having done some 50 miles taxiing, often on hard and bumpy ground and under very severe conditions.

"As for the engine, no words of praise are sufficient; during the 38 hours' flying of the competition it never gave even the slightest indication of trouble and did not need any more attention than that which one normally gives to an engine during touring flights; I may add that I did not spare the engine and that during the fourth leg the revs. were never under 2,200 and very often up to 2,350. I consider the results of all the Gipsy engines in this competition amazing, more so on account of the high temperatures in which we had to fly and the fact that all engines were under stress the whole of the time.

"It is needless for me to give you a detailed account of how all the engines behaved in the competition, as I expect you will receive a full account from Capt. Broad, but I wish to tell you that even if the Italian Press did not give enthusiastic reports on your products as it should have, all the competent people who followed the tour had no words of admiration but for the De Havilland production."

"The Flying Fool"

ONE of the best British films (now showing at the London Pavilion) incorporating flying that we have seen. The film is really rather too sharply divided into parts because, for a very large time we see practically nothing of any aircraft, with the exception of a trip to Paris, and then suddenly we see nothing else. Yet handled like this it is certainly rather effective and the climax is one of the best bits of flying seen on the films.

It is not an ambitious film. Its caste does not approach that so often used in American films and it has not been widely advertised, but it shows definitely that when necessary British flying can be used just as effectively, if not more so, than American or for that matter German.

There is a race between a Bentley and a Moth along a stretch of concrete arterial road, showing a mastery of the technique of aerial photography which bears comparison very favourably with anything in the really widely advertised aviation films. The story is of course a little bit thin, but we are almost getting to accept this as a necessary evil. What, however, we cannot understand, nor accept, until some reasonable explanation is offered, is the introduction of extraordinarily foolish little errors on the technical side, in this case the flying side. Why, for example, should the hero be shown running out to the tarmac and jumping into an "Argosy" when the next view shows a LeO. "Golden Ray" machine taking off and then, why when the scene changes to the interior

of this machine, should it become the interior of Hannibal. Similarly, why should we follow the progress of a "Golden Ray" across the Channel only to see an "Argosy" land; also why, when coming into land at the English terminal aerodrome, should a right-hand circuit be made? There are hundreds of perfectly capable men engaged in some form of aviation who would have put the Directors right on matters like this, and we hope that no more British films will be produced with such absurd mistakes. We can only imagine that those responsible rate the public intelligence so low and assume that they know nothing about flying and care less, otherwise they would realise that such errors tend to make a great deal of the film a laughing matter. The Control Room at the terminal Aerodrome and its equipment were no doubt meant to be somewhat prophetic, as also was, we hope, the behaviour of its officials. Apart from these matters of detail, however, we must congratulate British International Pictures especially for finishing their production with one of the finest photographs of a loop ever seen.

Chichester gets to China

MR. F. C. CHICHESTER, the New Zealand pilot, who is on a flight from his native country to England via China, Japan, Canada, Greenland and Iceland, arrived at Woosung, near Shanghai, during the afternoon of August 7. Mr. Chichester, who is flying a De Havilland and Gipsy Moth seaplane, had flown nearly 700 miles from Formosa.

Airisms from the Four Winds

Amy gets to Japan

MISS AMY JOHNSON, who left Lympne in her De Havilland Puss Moth on July 28 with Mr. Humphreys as engineer, arrived in Tokio on August 6, having completed the flight in about nine days, her actual flying time having been stated to be about 79 hours. Mr. Humphreys reported that the Gipsy III engine had given no trouble of any sort, and that no replacements had been necessary. The Fairey Aviation Company, who supplied a Fairey metal propeller for Miss Johnson's machine, has received a slightly exaggerated appreciation in the form of a cable, which read: "The success of the flight largely due to metal propeller, which gave 100 per cent. efficiency." As no propeller gives 100 per cent. efficiency, one can only assume that Miss Johnson meant to convey the idea that the propeller gave 100 per cent. satisfaction, and not 100 per cent. aerodynamic efficiency. Miss Johnson was given a magnificent welcome on her arrival in Tokio, whither she was escorted on the last short stage by a number of Japanese aircraft.

"Hannibal" Comes to Grief

WHILE on its way to Paris, on August 8, "Hannibal," the first of the Handley-Page H.P.42 machines delivered to Imperial Airways, had to make a forced landing at Tudeley, near Tonbridge. The landing was made in a very small field, and the tail which struck a hedge was torn completely off. In spite of this alarming experience, the pilot, Captain Dismore, managed to get down safely without the slightest injury to anyone. The initial cause which necessitated a forced landing has not been established, and the Air Ministry is conducting an examination into the crash, but it is thought that one of the propellers may have broken and one of the pieces hit one of the other engines, putting that out of action also.

American Pilot Missing

MR. PARKER CRAMER, who was on a survey flight from America to Denmark, and whose appearance in Greenland on August 5 came as a surprise, made a safe flight from Greenland to Lerwick, in Scotland, via Iceland and Faroe Islands, although he was forced to alight on the sea for a while some time after leaving Iceland. Cramer left Lerwick on August 9 with Copenhagen as his destination, via the west coast of Norway. Wireless

stations in Scandinavia picked up snatches of wireless telephonic messages, but these were too disjointed to be understood. They were, however, in English, and it is thought that they may have been sent out by Cramer and his engineer Paquette. At the time of going to press there is no news of the machine, and it would appear that it has been compelled to alight.

Camera Leads to Trouble

It is reported from Tokio that Herndon and Pangborn, the two American airmen who recently flew from New York to Tokio in an endeavour to beat the existing record for a flight around the world, and who had to abandon the attempt after reaching Japan, have been detained by the Japanese authorities, charged with having flown over, and photographed, fortified zones in Japan.

Going Home by Steamer

BOARDMAN and Polando, the two Americans who recently flew from New York to Constantinople non-stop, left Yeshilkeuy aerodrome on August 9, and made a non-stop flight to Marseilles, whence they will ship their machine home by steamer.

Progress of the Lindberghs

COL. CHARLES LINDBERGH and his wife, who are on their way from the United States to Japan, are reported to have reached Point Barrow, Alaska. On their way thither the Lindberghs have made the first non-stop flight across the North-West Territory.

Kingsford Smith to Try Again?

It might have been thought that he had had enough of it by now, but in spite of this it is reported that Kingsford Smith is planning an attempt to fly from Australia to England in seven days, and then, after a short rest, try to fly back to Australia again in about the same time. Why?

Cobham Surveying

SIR ALAN COBHAM, who is on a survey flight in a Short "Valetta" (Jupiter) seaplane over Africa, has been exploring lakes Albert, George Edward, Kiwu, and Tanganyika. The object of Sir Alan's journey is to try to find a way across from a point on the Cairo-Cape air route to Belgian Congo, so as to make possible the establishment of a connecting British air line.



THE TRANS-CANADA AIR TOUR: Two "snaps" from Canada concerning this event, which started from Hamilton, Ont., on July 1. They show (top) a group of "Siskin" pilots—left to right, Flt. Lt. H. W. Hewson, Wing-Com. G. M. Croil, Flt. Lt. W. I. Riddell, F/Os. E. A. McNab, R. C. Hawtrey and J. A. C. Gobeil. Below, the Fairchild 21, fitted with an Armstrong-Siddeley "Genet" Major and Townend Ring, which also took part.



LAUNCH OF U.S. AIRSHIP "AKRON"

On August 8 the new airship "Akron," built by the Goodyear-Zeppelin Corporation for the United States Navy, was launched, and Mrs. Hoover, wife of the President, performed the Christening Ceremony. The airship has a length of 785 ft., a diameter of 133 ft., and a cubic capacity of 6½ million cubic feet

"I CHRISTEN thee, *Akron*." With these words was America's new airship christened by Mrs. Hoover, wife of the President of the United States, at the launching ceremony at Akron, Ohio, on August 8. At the moment Mrs. Hoover spoke the words, 48 snow-white pigeons were released, this taking the place of the more usual breaking of a bottle of champagne.

The *Akron* is far and away the largest airship ever built, and thus is by way of being an experiment, although an experiment with all the experience of the Zeppelin Company behind it. The airship is of 6,500,000 cu. ft. capacity, and has a length of 785 ft. and a diameter of 133 ft. The useful lift is in the neighbourhood of 90 tons.

Several novel features are incorporated in the *Akron*, apart from the use of helium in place of hydrogen for the lifting gas, which has, of course, been used before in American airships. From the fact that helium is non-inflammable, it has been possible to house the engines inside the hull instead of having them in external nacelles. This reduces the drag, and should result in a higher maximum speed for a given power, and in either a higher cruising speed for the same power as in older airships, or in a lower fuel consumption at the same cruising speed.

The eight engines fitted develop 560 h.p. each, and drive the propellers via shafting and bevel gears on outriggers. The propellers are so arranged that they can be tilted through an angle of 90 degrees, so that they can be used for giving positive or negative lift while the airship is being manoeuvred on to or away from a mooring mast. It may be recollected that this system of swivelling propellers was used in this country several years before the war by Mr. Willows on his small non-rigid airships. The mechanical problems of transmitting the greater power of modern engines are, however, a good deal more difficult.

The only projection on the *Akron*, apart from the control surfaces, is the control cabin. She therefore looks a remarkably "clean" ship, and her performance will be watched with interest.

Inside the hull of the *Akron* are found many new features, but perhaps one of the most interesting is the compartment for housing five aeroplanes. These aeroplanes are placed on a trapeze arrangement, and will be lowered through a T-shaped opening in the bottom of the hull. Thus the only time they are exposed to the air stream is just after being lowered. Experiments in this country were carried out several years ago with R.33 and aeroplanes slung underneath the hull. The experiments were successful, but carrying the aircraft externally was scarcely a practical proposition. By the use of helium the Americans have been able to house their aircraft inside the airship until the moment of release. The trapeze arrangement has been so designed that it will be possible for the airship to pick up the aircraft again in flight, at least under favourable conditions.

Much work still remains to be done on the *Akron*, so that it will probably be several months before the first flight is made. The "launching" merely meant that the gas cells or ballonets were filled with helium until the airship just floated, and then the nose was permitted to rise slightly, the airship being allowed to move.

The *Akron* is to be commanded by Lieutenant Commander Charles E. Rosendahl, who was for several years commander of the *Los Angeles*, and who is one of the few survivors of the *Shenandoah* airship disaster. When that airship broke, Rosendahl was in the bow section, with which he free-ballooned safely to earth, landing about ten miles away from the wreck.

Second in command of the *Akron* will be Lieutenant Commander Herbert V. Wiley, who has also formerly commanded the *Los Angeles*.

Ultimately the *Akron* will form a unit of the American Pacific Fleet, and will be stationed at Sunnyvale, near San Francisco, where a base is being constructed. The second airship, which is being constructed by the Goodyear-Zeppelin Corporation for the American Navy, will probably be used in manoeuvres with the Atlantic Fleet. It will be of the same size as the *Akron*.

Mooring Mast and Lightning

FROM New York it was reported recently that the mooring mast on top of the tallest building, the Empire State Building, was struck repeatedly by lightning during a severe thunderstorm, and that time after time sheets of fire were seen to shoot past the windows of the building. This does not sound very promising for airship mooring masts on high buildings in the future.

Fire at Hythe

EVERYONE will sympathise most sincerely with Mr. Hubert Scott Paine, whose works at Hythe caught fire and were burned down, a number of very valuable speed boats and some tenders under construction for the R.A.F. being destroyed. Mr. Scott Paine was for many years part owner of the Supermarine Aviation Works at Woolston, and that firm's hangars at Hythe adjoin those of the British Power Boat Company. For a time the Supermarine hangars were in danger, but ultimately they were saved.

The Fairey Long-Range Monoplane Delivered

THE long-range monoplane (Napier "Lion"), designed and built by the Fairey Aviation Company at Hayes, was handed over to the R.A.F. on July 31. The two officers who will form the crew of the machine are Squadron-Leader Gayford and Flight-Lieut. Bett, and they are now putting the machine through its acceptance tests at the Fairey aerodrome. Later, the machine will be flown to Cranwell, Lincs., and there prepared for whatever long flights it is ultimately decided to make.

Hope's Appeal Dismissed

THE Royal Aero Club announces that the appeal of Mr. W. L. Hope against his disqualification in the recent London-Newcastle race was heard by the stewards of the

Royal Aero Club on July 29. The stewards who heard the appeal were: Lord Cozens Hardy, Brig.-Gen. Sir Capel Holden and Lieut.-Col. Moore-Brabazon. The appeal was dismissed.

Prize for Japanese Trans-Pacific Flight

THE Imperial Aviation Society of Japan has offered a prize of 100,000 yen (approximately £10,000) to the Japanese pilot who first carries out a non-stop flight in a Japanese-built aircraft across the Pacific. Refuelling will be permitted. The offer is open until September, 1933.

J. C. Webster killed

TRAGEDY has overtaken Mr. J. C. Webster, the Canadian pilot who recently took part in the King's Cup air race on a Curtiss-Reid "Rambler." While flying over St. Hubert aerodrome, it is stated, the machine got into a spin and crashed, Mr. Webster sustaining injuries from which he died later in hospital. His death occurred a few hours before an official reception, which was to have been given to celebrate Webster's return from England.

"Moths" for China

THE De Havilland Aircraft Co., Ltd., has recently received an order for six Military Moth training machines and two Puss Moth communication monoplanes. These machines are for the Chinese Military Aerodrome at Changsha, in the Hunan district of Southern China. Changsha is under the direct control of the Official Chinese Government, with headquarters at Nanking. The Moth Trainers will be used for the instruction of Chinese Air Force pilots, while the Puss Moths will probably be reserved for the personal use of high officials. The country around Changsha is intersected by a network of rivers, and it is likely that both types of machine will subsequently be fitted with floats.

THE ROYAL AIR FORCE

London Gazette, August 4, 1931

General Duties Branch

Group Captain J. E. A. Baldwin, D.S.O., O.B.E., is appointed Air Aide-de-Camp to the King (Aug. 1) (*vice* Group Captain Lionel Wilmot Brabazon Rees, V.C., O.B.E., M.C., A.F.C., retired); Air Commodore R. P. Mills, C.B., M.C., A.F.C., is appointed Director of Organisation and Staff Duties, Air Ministry (Aug. 1); Pilot Officer on probation E. C. Smith-Ross is confirmed in rank (July 12); Pilot Officer T. J. MacInery is promoted to rank of Flying Officer (Aug. 3); Group Captain H. R. Busteed, O.B.E., A.F.C., is placed on half-pay list, scale A (Aug. 3).

The follg. are placed on retired list at their own request:—Group Captain L. W. B. Rees, V.C., O.B.E., M.C., A.F.C., A.D.C. (Aug. 1); Wing Commander P. A. O. Leask (July 31). Squadron Leader E. R. Whitehouse is placed on retired list on account of ill-health (Aug. 5); Flying Officer F. G. Fairhead is transferred to Reserve, Class A (July 22); the short service commn. of Pilot Officer on probation G. G. Sharp-Bolster is terminated on cessation of duty (Aug. 5); Lt. H. A. Traill, R.N., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to Naval duty (July 20).

Stores Branch

The follg. Flight Lieutenants are placed on retired list:—W. Liniker (July 31); D. W. Wilson (Aug. 3).

Medical Branch

Flying Officer E. W. B. Griffiths, M.B., Ch.B., is promoted to rank of Flight Lieutenant (Aug. 5).

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

I. McL. Barratt is granted a commn. in Class AA (ii) as Pilot Officer on probation (July 23); Flying Officer G. H. Rawlinson relinquishes his commn. on completion of service (Nov. 13 1930).

AUXILIARY AIR FORCE

Accountant Branch

No. 690 (CITY OF LONDON) (BOMBER) SQUADRON. Pilot Officer R. Hiscox is promoted to rank of Flying Officer (Feb. 3).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore R. P. Mills, C.B., M.C., A.F.C., to Air Ministry, on appointment as Director of Organisation and Staff Duties, 1.8.31.

Wing Commanders: H. S. Powell, M.C., to No. 1 School of Tech. Training (Apprentices), Halton, for Administrative duties, 25.7.31. L. F. Forbes, M.C., to No. 500 Sqn., Manston, to command, 29.7.31.

Squadron-Leaders: C. B. S. Spackman, to No. 1 Sqn., Tangmere, 27.7.31. V. R. Scriven, A.F.C., to No. 9 Sqn., Boscombe Down, 25.7.31. H. W. Evans, to No. 202 Sqn., Malta, 17.7.31. G. S. N. Johnston, to No. 30 Sqn., Mosul, Iraq, 9.7.31. F. W. Walker, D.S.C., A.F.C., to H.Q., R.A.F., Transjordan and Palestine, Jerusalem, 13.7.31. C. H. C. Woollven, to No. 4 Flying Training School, Abu Sueir, Egypt, 8.4.31.

Flight-Lieutenants: L. Darvall, M.C., to No. 500 Sqn., Manston, 25.7.31. E. Burton, to Central Flying School, Wittering, 26.7.31. J. W. F. Merer, to R.A.F. Depot, Uxbridge, 28.7.31.

Flying Officers: W. H. Jones, to R.A.F. Depot, Uxbridge, 25.6.31. G. F. Overbury, to Armament and Gunnery School, Eastchurch, 29.7.31.

Pilot Officer D. M. Lynch-Staunton, to No. 2 Flying Training School, Digby, on appointment to a permanent commn., 11.7.31.

Stores Branch

Squadron-Leader P. J. Murphy, to H.Q., R.A.F., Cranwell, 1.8.31. Flight-Lieutenants: P. F. Connaughton, to H.Q., R.A.F., Cranwell, 23.7.31. E. R. Wood, to School of Photography, S. Farnborough, 20.7.31. G. J. Mavgothling, to R.A.F. Depot, Uxbridge, 5.7.31.

Flying Officers: R. E. P. Paynter, D.C.M., to Station H.Q., Northolt, 27.7.31. W. H. Dyson, to Station H.Q., Kenley, 27.7.31. C. W. Goodchild, M.B.E., to Station H.Q., Hornchurch, 27.7.31. R. J. Williams, to School of Photography, S. Farnborough, 27.7.31.

Accountants' Branch

Flight-Lieutenant A. J. Moore, to Station H.Q., Northolt, 1.8.31. Flying Officers: R. L. M. Hall, to No. 26 Sqn., Catterick, 25.7.31. H. D. Nicholson, to No. 593 Sqn., Lincoln, 22.7.31.

Medical Branch

Flying Officer: O. M. Fraser, to Medical Training Depot, Halton, on appointment to a short service commn., 30.6.31.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—LIEUTS.—N. G. R. Crawford, attached to R.A.F. (Sept. 20); M. S. Slattery (Flt. Lieut., R.A.F.), to *Courageous* (Aug. 8). MATE.—E. W. Lawson, attached to R.A.F. (Sept. 20).

HALTON NO. 1 SCHOOL OF TECHNICAL TRAINING (APPRENTICES) R.A.F.

THE following are extracts from the Report by Air-Commodore I. M. Bonham-Carter, C.B., O.B.E., Air Officer Commanding, Royal Air Force, Halton, upon the occasion of the passing-out of the 18th Entry of Aircraft Apprentices. The inspection was carried out by Air Chief Marshal Sir John Salmond, G.C.B., etc., Chief of the Air Staff.

The apprentices now passing-out from Halton form the 18th Entry to pass into the service on completion of the course of apprenticeship training. Of the 574 boys originally attested, 474 are due to pass-out from No. 2 Apprentices Wing, Halton.

These have been trained in the following trades:—Fitter, aero engine, 242; fitter, armourer, 17; fitter, driver petrol, 36; metal rigger, 164; copper-smith and sheet-metal worker, 15.

As a result of the final examination, 47 aircraft apprentices have been classified as Leading Aircraftmen; 324, representing 68.35 per cent. of the entry, have been classified as Aircraftmen, 1st class; 99, representing 20.88 per cent. of the entry, have been classified as Aircraftmen, 2nd class. No aircraft apprentices failed to qualify. Four were not examined, owing to sickness.

Metal Riggers

The September, 1928, entry is the first entry to be trained in No. 2 Apprentices Wing in the trade of metal rigger.

Difficulties were experienced in the early stages of their training, owing to the necessary changes in instructors; many of the carpenter-rigger instructors were not qualified as metal riggers and had to be replaced. These new instructors, although fully qualified in their particular trade, naturally took some time to become accustomed to teaching.

The apprentices of this entry have constructed one Mussel airframe and one Southampton wing-tip float from raw materials. Two other floats of the same type have been partially completed.

The only type of metal repair which could be demonstrated on the aircraft was that of Armstrong Whitworth, as applied to the Siskin airframe. It is hoped that damaged all-metal airframes of modern types will be made available, to enable the course of repairs to metal aircraft to be carried out more fully. Considering the difficulties which are bound to be experienced

in dealing with a new trade, the entry as a whole has done well, and has attained a good standard.

On arrival at Halton, the entry was of a satisfactory educational standard. They were distinctly promising and have lived fairly well up to early expectations.

As a result of the final educational examination, 56 gained "A" certificate, i.e., 75 per cent. and over; 374 gained "B" certificate, i.e., 50 per cent. and under 75 per cent.; while 45 failed to obtain 50 per cent. of the total number of marks.

The standard of drill and discipline of this entry has been good. They have had the advantage over previous entries in having had the opportunity to carry out route marches, and a long week-end summer camp during their final term. March discipline, camp sanitation and the erection and striking of camp were practised. This experience will undoubtedly prove of value to them during their service life.

The health of the entry has been good. The sickness rate has been particularly low for the last winter and the amount of infectious disease less than in any of the other entries housed in Henderson and Groves Barracks. The incidence of rheumatism has been the lowest for three years. This, I think, may be partly due to the provision of oilskin coats.

Awards

The following is a list of the awards offered by the Air Ministry:—

Grand Aggregate.—Disbrey, W. D.
Educational Subjects.—1st Prize: Disbrey, W. D.; 2nd Prize: King, D.
Fitters, Aero Engine.—1st Prize: Disbrey, W. D.; 2nd Prize: Finlay, D.
Metal Riggers.—1st Prize: Porter, A. H.; 2nd Prize: Kennett, H. G.
Coppersmith, Fitter Armourer and Fitter D.P. (Combined).—Ricketts, H. P.
The Lord Wakefield Scholarship has been awarded to Disbrey, W. D.
Cadetships.—Cadetships have been offered to:—Badger, J. V. C.; Disbrey, W. D.; Becker, B. H.; Chacksfield, B. A.; and Finlay, D.
Elliott Memorial Prize.—The Elliott Memorial Prize has been awarded to Taylor, S. G.

AIR MINISTRY NOTICES

NOTICES TO GROUND ENGINEERS

No. 37 of 1931. Avro "Avian" Aircraft: Main Plane Ribs (117,878/31).

Owing to the failure of main plane ribs in Avian aircraft, those with flanges $\frac{1}{4}$ in. wide by $\frac{1}{8}$ in. deep with a three-ply web on one side only and without metal saddle clips at the spar position, have to be modified. Any such ribs fitted are to be replaced by the latest type of Avian rib to Drawings F.1621 and F.1644. Avian aircraft marked I, II and III are not fitted unless the original main planes have been changed. Avian aircraft marked III and IV may continue flying provided that an examination of the ribs has been made and that these are seen to be completely satisfactory and that they are modified if necessary before January 1, 1932. Avian aircraft marked IV and IV.M are not to be flown until a very careful examination of the ribs has been made. If these are satisfactory flying in the normal category only may be continued until August 14, 1931, after which the necessary modifications must be carried out. In no circumstances may aerobatic flying be carried out

until these ribs have been modified. Mark IV.M aircraft which have main planes manufactured later than October, 1930 (Serial No. 68944) and onwards are exempt from this notice. Avian aircraft with 30 ft. span main planes are not affected by this notice.

No. 40 of 1931. Gipsy II and III Engines. (124,136/31)

It has been found that there is a tendency for the thread of the bolts securing the rocker brackets to the cylinder head to stretch in service. A stronger bolt has therefore been introduced which it is considered desirable to fit as soon as possible. The requisite part can be obtained from the De Havilland Aircraft Co., Ltd., Stag Lane, Edgware.

NOTICES TO AIRMEN, SERIES A

No. 43 of 1931. Farnborough and Orfordness Rotating Wireless Beacons. (924786/29.)

The rotating wireless beacon at Cove, near Farnborough, ceased to transmit for ordinary navigational purposes on July 26. The experimental beacon at Orfordness will not operate from August 11 to August 18, but normal transmission will be resumed after this latter date.

THE INDUSTRY

Atlantic Airways, Ltd.

GARROWAY, BLACK & CO., LTD., wish it to be known that they have severed their connection with Atlantic Airways, Ltd., and have resigned their position as managing agents and secretaries of that Company.

Lodge Plugs in Miss England II

LODGE PLUGS are so well known in the aviation world that their excellence is almost taken for granted. Many people, however, do not know that latterly they have been chosen by most of the experts for motor boat work, one of the latest of which was the motor boat speed record, which was broken at 110 m.p.h. by Mr. Kaye Don when driving Miss England II.

A New Appointment

MR. E. C. BROWN, who until recently has managed the Aviation Department of W. B. Dick & Co., the Ilo oil people, has now relinquished that position and taken over full charge of the aviation side of Alexander Duckham & Co. We understand that this firm will follow a very progressive policy with regard to the sale of their oil for aircraft purposes, and we have no doubt that Mr. Brown will make a success of it. This means that his time will be very fully occupied, but not so much we hope that he will be unable to continue broadcasting as he does at almost every aviation meeting of note.

New Showrooms at Heston

AEROFILMS, LTD., of Colindale Avenue, Hendon, N.W.9, have recently opened a new showroom at Heston Air Park. They will have on exhibition aerial, press, and snapshot cameras suitable not only for those engaged upon press work but also for those pilots who are keen amateur photographers. Supplies of photographic materials, accessories and films will also be available. A complete photograph unit is stationed there well able to deal with commercial and aerial photography. Bray Gibb & Co., Ltd., the aircraft insurance agents also have an office in the showroom with somebody always in attendance. The telephone number for both Aerofilms and Bray Gibb is Hayes 410, extension 47.

Hangars

THOSE who want really good hangars which can be relied upon to give very many years of trouble-free service, or any other Aerodrome buildings such as workshops or lock-up garages should certainly investigate those built by William Bain & Co., Ltd., whose works are at Coatbridge, Scotland, and whose London office is 110, Cannon Street, E.C.4, before deciding upon where to place their contract. Bain-built hangars have been erected in all parts of the world, and this firm is in a position to estimate for all necessary concrete work such as floors, etc., and in fact for any part of the complete installation.

Engine Speed Indicators on Short "Kent" Flying Boats

THE Record Electrical Co., Ltd., of Broadheath, Altrincham, Cheshire, inform us that the latest electric-type engine speed indicators manufactured by them are fitted to the three Short "Kent Flying Boats" used in the Mediterranean by the Imperial Airways.

Sperry Gyroscope Company's New Headquarters

WE understand that the Sperry Gyroscope Co., Ltd., which was founded in 1913 with offices in Victoria Street, and later moved into larger quarters at Shepherd's Bush, has just transferred to a new factory, which now includes the Head Office, at Brentford, on the Great West Road. Their telephone number is now Ealing 6771.

Kayser, Ellison Valves

KAYSER, ELLISON & CO., LTD., of Carlisle Works, Sheffield, report another success with their K.E.965 valve steel. They have received the following telegram from the Cirrus Hermes Engineering Co., Ltd.:—"Cirrus Hermes first and second King's Cup Race fitted your valves one hundred per cent. reliability."

South Coast Glider Works for Sale

A WELL-KNOWN and very successful Glider Construction Works, situated on the south coast of England, is for sale. This factory has produced a training type glider similar to the German Zögling, an intermediate glider and a sailplane of the efficient type, all of which have performed admirably. Owing to the management having other work on hand they have decided to dispose of their entire interest.

The Ford Aerodrome as a Going Concern

THE Ford aerodrome near Yapton, Sussex, now belonging to the Ford Motor Company, has been marked by the "Ford Oval," in chalk, in the centre of the aerodrome.

PUBLICATIONS RECEIVED

U.S. National Advisory Committee for Aeronautics Reports: No. 374, *The Automotive Ignition Coil*. By T. H. Darnell. Price 25 cents. No. 377, *A Method of Flight Measurement of Spins*. By H. A. Soule and N. F. Scudder. Price 10 cents. No. 380, *Pressure Distribution over the Fuselage of a PW-9 Pursuit Airplane in Flight*. By R. V. Rhode and E. E. Lundquist. Price 20 cents. No. 384, *The Comparative Performance of Superchargers*. By O. W. Schey. Price 5 cents. Superintendent of Documents, Washington, D.C., U.S.A.

Sailing the Skies: Gliding and Soaring. By Malcolm Ross. London: Macmillan & Co., Ltd. Price 10s. 6d. net.

Elementi di Aviazione. Vol. I. By Gen. G. A. Crocco. Alberto Stock, Rome. Price 120 Lire.

Aluminium Architecture and Decoration. The British Aluminium Co., Ltd., Adelaide House, King William Street, London, E.C.4.

Guide des Aerodromes Belges. Administration de l'Aeronautique, Brussels.

Interludes. Vol. 1, No. 3. July, 1931. Intertype, Ltd., 241, Blackfriars Road, London, S.E.1.

A Complete Course for the Commercial Flying Licence. By Capt. W. L. Hope and N. Kennedy. London: John Hamilton, Ltd. Price 21s.

Forschungsheft 345. Zur Konstruktion von Kurvenscheiben bei Verarbeitungsmaschinen. By Dr.-Ing. Karl A. Flocke. V.D.I.-Verlag G.m.b.H., Berlin. Price Rm. 5.00.



NEW COMPANIES REGISTERED

BOYD-CARPENTER & CO., LTD.—Capital £10,000, in £1 shares (8,000 7½ per cent. cumulative preference and 2,000 ordinary). Acquiring the business of manufacturers of all kinds of parts, fittings and accessories of aeroplanes and motor cars, carried on by B. C. & Co., Ltd., at their Works at Kingsgate Place, Kilburn, and patents and other assets. Directors: F. H. Boyd-Carpenter (chairman), 46, Coleherne Court, S.W.5, and W. F. Rimmer. Solicitors: Stow, Preston & Lyttelton, 12, Lincoln's Inn Fields, W.C.2.

SCOTTISH EASTERN AIRCRAFT SERVICES, LTD., Mill Road Earlston, Berwickshire.—Capital, £1,000 in 500 7 per cent. cumulative preference shares of £1 and 2,500 ordinary shares of 4s. each. Instructors in aviation and aerial navigation, manufacturers of aircraft of all kinds, etc. Directors:—W. Rodger, 2, Halcombe Crescent, Earlston, Berwickshire, contractor; G. M. Rodger, 2, Williambank, Earlston, Berwickshire, contractor.



AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1930

Published August 13, 1931

- 1,457. PETTERS, LTD., and G. T. R. HILL. Means for adjusting wings. (352,961.)
1,458. PETTERS, LTD., and G. T. R. HILL. Undercarriages. (352,962.)
19,633. MASCHINENFABRIK AUGSBURG-NURNBERG AKT.-GES. Charging two-stroke cycle i.c. aircraft engines. (353,213.)
21,291. Y. L. J. POTTIER. Windscreens. (353,237.)
25,466. FIAT SOC. ANON. Driving-gear for propellers. (353,294.)
27,964. G. W. WINDSOR and A. E. GRIMM. Vertical-lift aeroplane. (353,316.)
35,495. SOC. ANON. FIAT. Carburettors of aircraft engines. (353,360.)

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- 2,191. BENDIX AVIATION CORPORATION. Grease feeder. (353,001.)
2,192. BENDIX AVIATION CORPORATION. Grease feeder. (353,002.)
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